

RECENT DEVELOPMENTS AFFECTING SCHOOL BUILDING.

By PERCY MORRIS [A.], Cates Prizeman 1897, Architect to the Devon County Education Committee.

Read before the Liverpool Architectural Society, 17th February 1913.

MY purpose in addressing you this evening is to bring before you some recent developments affecting school building, and to discuss the causes which have produced them; but whilst dealing with those factors which are already operative it is necessary to mention others which may become so in the near future. My remarks will be confined chiefly to Elementary Schools, since it is in this respect that changes are at present most noticeable, but they involve principles which are equally applicable to every type of school building.

We are passing through a period of general unrest far-reaching in its influence, and architects come into contact with it at many points. In the direction of school planning it is especially active; and we are told by our critics that in this regard doctors and architects disagree, not only with the Board of Education, but also among themselves. To some extent this is true, so that amid the tangled web of conflicting ideas it may not be unprofitable if we review the trend of events, in the hope that such a survey may have a steadying effect, and, in restoring balance, may adjust also our sense of proportion.

If you glance at the history of school planning since the end of the eighteenth century, you will find, speaking very roughly, that the close of each quarter of a century has been punctuated, as it were, by the introduction of a new type of plan, differing essentially from its predecessor and destined to supersede it. First we have the *Lancasterian school* [fig. 1], a large room with its raised platform at one end for the master, desks generally in the centre of the room facing the platform, and space at the sides for children to stand in groups during instruction. One master was in charge of perhaps 1,000 children, and his duty during school hours was largely that of superintendence rather than teaching—the theory underlying the system being one of self-instruction by the children themselves, a number of whom were trained as monitors for the purpose.

This type was succeeded about 1826 by schools planned upon the *Stow system* [fig. 2], consequent upon a reaction against the employment of monitors, and a movement in favour of staffing with qualified teachers. The school was characterised by the provision of a large gallery at one end of the room, whilst the desks were arranged at the sides, and the central

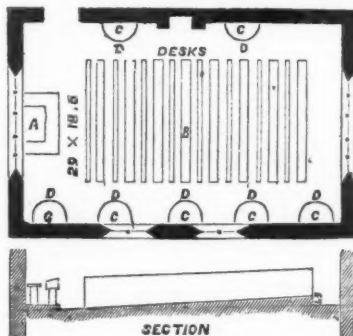


FIG. 1.—LANCASTERIAN SCHOOL.



FIG. 2.—SCHOOL ON STOW'S SYSTEM.

space was left unencumbered by furniture. An essential adjunct was a large playground, or "uncovered school-room" as it was called, for games and physical exercises under supervision of the teachers.

The advent of the *Pupil Teacher system* in 1846, and its general adoption about 1850, was responsible for the next change [fig. 3]. The rooms became narrow, and had desks on one side only; the latter were

arranged in groups divided by curtains, but in such a way as to allow supervision by the head teacher.

The year 1870 marked a period of great activity in educational matters. The passing of the Elementary Education Act and the creation of School Boards, among them the "School Board

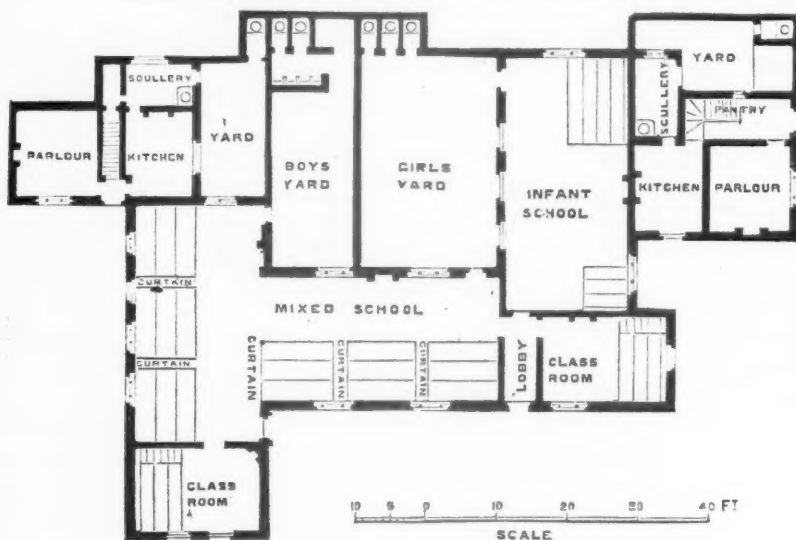


FIG. 3.—INFANTS' AND "MIXED" SCHOOL FOR 250, AS SUGGESTED BY EDUCATION DEPARTMENT.

for London," necessitated the erection of new buildings throughout the country. At such a time it was natural that comparison should be made between the method of school planning adopted in this country and that followed on the Continent. Professor Huxley's Committee, reporting in 1871 to the London School Board upon the result of their inquiries as to the Prussian plan of school building, recommended as an experiment the erection of a school which was a modified reflection of the Prussian model. The "Ben Jonson" school in Stepney [fig. 4],

the prototype of a long line

of successors known as "the central hall type," was the result. It took the form of a 3-story building, the boys' and girls' departments each consisting of a series of eight classrooms grouped around, and entered from, an assembly hall, whilst the practice of lighting from the left side adopted on the Continent was introduced in most of the rooms. Such a departure from

previously accepted principles did not escape severe criticism, and its adoption was gradual, until finally it became, and remained until quite recently, the model upon which most of the larger buildings were planned. It is this type of school upon which attention is now focussed, and which is responsible for the present upheaval.

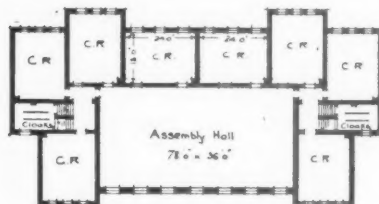


FIG. 4.—BEN JONSON SCHOOL, STEPNEY (ERECTED 1872).

The need of brevity has compelled me to sketch in the merest outline the progress of events during the nineteenth century, but I do not wish to create the

impression that absolute rigidity of type was adhered to; on the contrary, we find small classrooms attached to some of the earliest schools, although belief in "the sympathy of numbers" favoured large rooms. Similarly, after the acceptance of the central hall type, many schools, as you are aware, particularly the smaller ones, developed upon previous lines with an increasing number of classrooms, and sometimes with corridors giving independent access to the rooms.

At the start and for some time subsequently, the chief, one might almost say the determining, factor in school planning was undoubtedly educational requirement. The "Building Rules" even in 1871 do not mention the word ventilation, the sole provision in this respect being a requirement that a large part of each window should be made to open. It would be unfair to assume, however, that hygienic principles were not recognised, for Mr. Robson wrote in 1874: * "To the school architect hygiene means the rules which should regulate the situation, construction, ventilation, warming, lighting, and furnishing of the building." Later the effect of hygienic influence became more marked, but in the light of recent events it was not predominant.

Since the opening of the twentieth century events have marched rapidly, and the constant flow of legislation has been somewhat bewildering. The year 1902 saw the passing of a new Education Act, the extinction of School Boards, and the establishment of new Authorities. In 1907 Medical Inspection was embodied in the Administrative Provisions Act and marked the recognition by Government of a new factor in the case: the result of external pressure renewed with increasing energy. In 1911 the Administrative Provisions Act gave effect to the recommendations of the Departmental Committee on the Cost of School Buildings in regard to the exemption of new buildings from the operation of local building by-laws and similar provisions in local Acts, the adoption of novel materials or methods in school building, and the conditions of granting loans.† Further legislation will no doubt follow as the outcome of the labours of the Departmental Committee on School Playgrounds, which has recently reported.‡

As in 1870 so in 1902 the time was ripe for a comprehensive review of affairs which led inevitably to a readjustment of ideas upon many points. Following closely came the appointment of School Medical Officers fully equipped for an immediate operation upon the central hall on the grounds that it interfered with proper cross-ventilation. One of their number had for some time previously been engaged upon the dissection of the Board's "Building Rules," and had articulated the skeleton in a manner regarded at Whitehall as grossly irreverent. But, to be serious, it is undoubtedly from this infusion of new blood that initiative in the direction of better-equipped and more healthy schools has sprung, and it would be ungracious if architects were not to acknowledge the immense service which has been rendered to them.

If in the nineteenth century educational requirement exercised undue influence, or, if you prefer it, Hygeia had not sufficiently asserted her rights, their close collaboration is now recognised as indispensable. We see that the mistake in the past lay in the adherence of the powers above to a particular type of plan; in defence it may be urged that the same procedure had been followed in other countries, and that in the earlier days, when knowledge of the requirements was confined to a few specialists, some guiding idea was necessary. Yet there can be no doubt as to the mischievous tendency of such a policy. In the case of the central hall, approval came alike from School Boards, teachers, and architects; one might say that doctors gave tacit approval, because there were medical officers of health in those days concerned with the proper sanitary condition of schools. I can recall several instances in which District Councils have, on the reports of their medical officers, made requirements as to ventilation; and if the defect in

* *School Architecture*, E. R. Robson.

† *Report of the Departmental Committee on the Cost of School Buildings*. (Eyre & Spottiswoode, 1911.)

‡ *Report of the Departmental Committee on the Playgrounds of Public Elementary Schools*. (Eyre & Spottiswoode, 1912.)

regard to central halls was so obvious as we are now asked to believe, why was there no warning chorus? On the assumption that a chorus is usually preceded by a solo, may we not conclude that no soloist had at that time given the lead?

It was at the second International Congress of School Hygiene in 1907 that the newer tendencies were brought prominently forward, and I well remember the mixed reception accorded to the plan* which Dr. Reid, County Medical Officer of Staffordshire, produced and explained to the Congress, and the pungent criticism with which he assailed the Board's "Building Rules." Many of the principles he then laid down, and to which he was largely instrumental in obtaining the unwilling assent of the Board, have now been accepted as sound ones, and medical officers have since that date borne an increasing share in shaping a new course. After all, this is surely as it should be. Educationists may be agreed as to what is desirable from their point of view, and, following instructions, architects can plan buildings to meet those requirements, which, when compared with what has preceded them, show marked improvement, but progress upon these lines is apt to move in somewhat narrow compass and to be too much controlled by precedent. It needs strong external pressure, unfettered by preconceived ideas, to arrest such a tendency, and this has been exerted to the utmost in the matter before us. The standpoint from which we regarded the subject has been shifted, and the view broadened in consequence.

Personally I welcome the innovation, because neither educationists nor architects are qualified to apply a crucial test, and if it can be proved by medical inspection that certain physical defects in children are fostered by the older conditions, and can be eradicated or are non-existent under the new, surely we must admit that there is *prima facie* evidence in favour of reform. Now in this respect it appears to me that the legitimate function of an architect is to give effect to principles rather than to define them, and that the procedure should be somewhat on the following lines, acting in three directions, but interdependent: first, that the educationist and medical officer, acting in conjunction, should define general principles to be observed in planning school buildings suitable alike to the needs of education and health; secondly, that the Education Authority should state their requirements, giving instructions as to accommodation and kindred matters; thirdly, that the architect should find a practical solution of the problem by applying the general principles to the needs of the particular case. We find a parallel in the triangle of forces: if three forces, represented in magnitude and direction by the sides of a triangle taken in order, act upon a point, they will be in equilibrium. If this be the position, provided reasonable latitude of discretion is allowed, there should be the fullest scope for all concerned without danger of overlapping.

One of the healthiest signs of the new order of things, and one which is of happy augury for the future, is growing recognition of the fact that, within an area defined broadly by the same guiding lines, it is often possible to find more than one satisfactory solution of a problem. This ought to lead, I think, to an attempt to differentiate between the needs of a school building placed in the heart of an agricultural district and one situated in a crowded centre of industry. I am not suggesting an alteration of principle, but merely another line of application.

I have referred to an area which permits free movement, there is danger in circumscribing it. As an illustration of my point: the Board's "Building Rules," so far as they apply to units, are with some exceptions reasonably in accord with recent developments; but in their recommendation as to the disposition of the units we find them out of touch with present needs, and it is an interesting fact that a plan conforming in all respects with the "Rules" as they stand would not find favour at Whitehall. This statement, if unqualified, would be unjust, because the recommendations of the Departmental Committee on the Cost of School Buildings have been accepted

* See *Public Health*, November 1907.

and will modify the rules in many respects both as to planning and construction, and, as I have mentioned, further modification will doubtless follow in respect of playgrounds.

If I may say so, the Board have, I think, most wisely refrained from issuing new "Rules" at such a time. During a period of transition, some have referred to it as revolution, it is not the time to adopt as decisive, principles which may be modified in the light of further experience. The statistics of medical inspection are not yet available over a sufficiently long period; such as we have, are inconclusive, and in some cases baffling, but we look with confidence to a time when, as the outcome of co-ordination, a comparison of the results of research in definite directions will not only be possible, but of the greatest service. For example, an independent investigation of the influence of lighting of schoolrooms upon eyesight, made in Surrey by two of the County Medical Inspectors, is noted in the Annual Report of the School Medical Officer of that county.* In both cases the result is paradoxical, the percentage of defective eyesight being most marked in well-lighted schools. The following table gives the figures of one of the Inspectors:—

Age 7-8.		Age 13-14.	
Well-lighted schools,	8.5 per cent. (235).		15.2 per cent. (760).
All others	8.0 „ (549).		13.4 „ (737).

I should hesitate to mention this, because it is not put forward in the Report as in any way conclusive, and it is just the kind of evidence which is seized upon and exploited for an unworthy purpose; but I do so because I want to drive home the point that there are so many undetermined influences at work, possibly external, which may affect results that, unless we tread very warily at the present time, we may find ourselves groping in a blind alley. Further than this, the change has been marked by controversy into which unnecessary heat and mutual recrimination have been introduced. Would it not be better to sink our differences and make good those points, and there are many, upon which we are agreed? It is only by so doing that we can hope to carry public opinion with us. What we want at the present time is not the multiplication of experts, each with his own nostrum, but students keenly alive to every new move who can view the situation with a certain amount of detachment, and exercise discrimination in the adoption of new ideas. A theory pushed to extremes may become a mere fetish.

Having now cleared the ground to some extent by a general survey of the situation, I propose to examine at closer quarters the effect of the movement in specific directions, and my subject here calls for sub-division into four headings:

1. Playgrounds and Sites;
2. Ventilation and Heating;
3. Planning; and
4. The Cost of School Buildings.

This order is necessary because the first two on the list influence the third, and all three bear directly upon the fourth.

PLAYGROUNDS AND SITES.

In regard to playgrounds the Report of the Departmental Committee will be received with mixed feelings by Education Authorities. There must necessarily be cases where the enforcement of too rigid rules would impose considerable hardship, and these should no doubt be considered upon their merits, but it would obviously be unwise to base rules for general application upon exceptional conditions prevailing in particular districts.

The terms of the reference are no doubt known to you, but the subject is dealt with in the Report in too comprehensive a manner for me to cover the whole ground, and I can only touch

* Annual Report, 1911.

upon the conclusions arrived at without fully discussing the reasons upon which they are based.

The purposes of a playground are said to fall under seven headings, which may be epitomised as follows :—

- (1) To secure light and ventilation, to avoid noise, and provide sufficient space for offices.
- (2, 3, and 4) To meet the requirements of the Code in regard to recreation, physical exercises, and organised games respectively.
- (5) To give space for open-air classes.
- (6) To permit assembly of the children and give space for some of them to play before and between school hours.
- (7) To provide a place for recreation during holidays and on Saturdays.

The first five of these directly affect planning ; whilst 6 and 7 need not concern us if the requirements of the former are met.

Arising out of No. 1, the Committee emphasise the effect of surrounding buildings upon light and ventilation, and very rightly recommend that drawings and particulars of these should in all cases be submitted to the Board with plans of new schools or alterations of existing ones. The annoyance of traffic they point out is best met by choice of a suitable site. The proximity of offices to the school was a subject upon which there was difference of opinion and the point was left an open one. In theory I admit there should be no difficulty in placing them closer to the school, but, speaking from experience, I am convinced that general relaxation of the rules in this respect, especially in country districts, would at present be inadvisable, although exceptions might be made. Regulations which may be perfect on paper are sometimes difficult to enforce.

With regard to Nos. 2, 3, and 4 : for recreation during the interval the Committee agreed that 20 square feet for each boy or girl and 16 feet for each infant is sufficient, provided the department is fairly large and the shape of the playground suitable. There was general agreement that physical exercises should, when possible, be taken in the open air, and useful information was given as to the space required.* The following table shows this for Standard VI. boys :—

No. in Class	Free exercises only				Including marching, running, and games
	Opened out		* Allowing space for observation		
	ft. in.	ft. in.	ft. in.	ft. in.	—
20	22 0 by	12 0 = 264 sq. ft.	34 0 by	24 0 = 816 sq. ft.	
30	32 0 "	12 0 = 384 "	44 0 "	24 0 = 1,056 "	58 0 by 26 0 = 1,508 sq. ft.
40	42 0 "	12 0 = 504 "	54 0 "	24 0 = 1,296 "	66 0 " 30 0 = 1,980 "
50	52 0 "	12 0 = 624 "	64 0 "	24 0 = 1,536 "	75 0 " 33 0 = 2,475 "
60	62 0 "	12 0 = 744 "	74 0 "	24 0 = 1,776 "	80 0 " 37 0 = 2,960 "

* At each side of the class, 6 feet ; at back of the class, 4 feet ; in front of the class, 8 feet.

The dimensions given are important because a similar area of another shape may prove very inconvenient. The evidence was in favour of taking one class at a time, and the conclusion arrived at was that for a department of not more than seven or eight classes one space would be sufficient. A tendency to secure larger sites and reserve a part for organised games was mentioned, and the opinion was expressed in evidence that for this purpose there is little object in exceeding an acre for a department of about 600 unless two acres is acquired. Apart from provision for organised games, whether by the purchase of larger sites or the supplementary use of public recreation grounds, it was shown that many games can be played in a modified form in a play-

* H.M.I. Grenfell's evidence, *Departmental Committee's Report*, p. 143.

ground which allows 30 square feet per child, provided the department is large enough; the intention being that each class should use it in turn under supervision of the teachers, and when so used the checking of unnecessary noise should be part of the discipline.

In regard to No. 5 there is to be an increasing tendency to use the playground for open-air classes, but the practice is not regarded as a determining factor in the size of the playground.

Briefly the *Recommendations of the Committee in regard to New Schools* are:—

(1) That the shape of the playground should be suitable, and passages, forecourts, &c., be omitted in calculating the minimum area.

(2) (a) That there should be separate playgrounds for boys and girls except in very small schools.

(b) That playgrounds for girls and infants need not be separated.

(c) That where girls and infants use the same playground the area, subject to special conditions, must be sufficient for the total number of children.

(d) That areas be provided as follows:—

	If other provision is made for games		If no other provision is made for games	
	Each boy or girl	Each infant	Each boy or girl	Each infant
Each undivided playground for 200 and upwards.....	20 sq. feet	16 sq. feet	30 sq. feet	16 sq. feet
Each undivided playground for less than 200..... 2,000 sq. feet	+ 10 sq. feet	+ 6 sq. feet	+ 20 sq. feet	+ 6 sq. feet

Comparing the recommendations with present requirements (30 feet per head), the following table shows the increased or decreased area per head and its percentage:—

	If other provision is made for games		If no other provision is made for games	
	Each boy or girl	Each infant	Each boy or girl	Each infant
Each undivided playground for 200 and upwards	- 10 sq. feet (- 33·3 per cent.)	- 14 sq. feet (- 46·6 per cent.)	No alteration (")	- 14 sq. feet (- 46·6 per cent.)
Department of 50 children	+ 20 sq. feet (+ 66·6 per cent.)	+ 16 sq. feet (+ 53·5 per cent.)	+ 30 sq. feet (+ 100 per cent.)	+ 16 sq. feet (+ 53·5 per cent.)
" " 100 "	No alteration (")	- 4 sq. feet (- 13·3 per cent.)	+ 10 sq. feet (+ 33·3 per cent.)	- 4 sq. feet (- 13·3 per cent.)
" " 150 "	- 6·7 sq. feet (- 22·7 per cent.)	- 10·7 sq. feet (- 35·7 per cent.)	+ 3·3 sq. feet (+ 11 per cent.)	- 10·7 sq. feet (- 20·8 per cent.)

Exceptional Cases.—The Committee recommend that where the cost of sites is excessive each case shall be dealt with on its merits, having regard to the financial burden imposed. Thus it is pointed out that the cost per square yard may vary from 10s. to £9 10s. 6d., and in each case be regarded as excessive by the authority concerned. The produce of a 1d. rate per scholar is therefore suggested as a basis of comparison.* There is one point not dealt with in the Report but which may possibly be mentioned in the evidence:—I refer to the cost of development as apart from the original cost of the site, e.g. in Devon we pay from 3d. to 4s. 6d. a square yard for land; these are about the limits, but owing to the hilly nature of the ground the cost of excavation and retaining walls is often very heavy. It may be said that in these circumstances the purchase of more suitable land at a larger price would be economical; so it would be if there were any choice in the matter, but in many cases there is no alternative. In one instance the estimated additional cost of the school due to site was as much as £4 per head, or an equivalent of 3s. 3d. per square yard added to the original cost of the land.†

* Varies from 1s. 2d. to over 9s.; Devon = 3s. 5d.

† 5½d. per square yard.

Roof Playgrounds and Detached Playgrounds were suggested as offering possible chances of relief in special cases, and the former will no doubt be largely adopted in meeting the changes foreshadowed in respect of existing schools upon cramped sites. The merits and disadvantages of roof playgrounds are discussed, and the objection that they are often smoky and wind-swept is not regarded as serious except in special cases; but the need of additional stairs, making them prohibitive for infants, and their unsuitability for ball games are recognised as the chief drawbacks. The advantages pointed out are suitability for open-air classes, and the fact that, if the floor is made sound-resisting, they can be used in shifts. In planning such playgrounds the points to be borne in mind are said to be shape, freedom from obstructions, easy supervision and access. The Committee recommend that roof playgrounds should be accepted and be deemed, without the application of any numerical rule, to provide sufficient accommodation for the children, other than infants, occupying one floor.

The acceptance of detached playgrounds as an expedient for overcoming difficulty in special cases is not recommended unless the site is within about one minute's walk of the school.

Choice of Sites.—A recommendation made by a witness as to the desirability of school sites being near open spaces is admitted to have obvious advantages, but the Committee dismiss it as possible only in exceptional cases.

The *Use of Parks* is recommended on condition that space is available which has not to be shared with the general public, and that there are no drawbacks of a similar nature.

The subject of *Surface Coverings* is important, and one which is likely to require a good deal of attention in the near future. In regard to large playgrounds there was general, but not unanimous, opinion that tar paving was the most suitable. It is difficult to see why size should be a qualification; my experience is that the surface of a small playground of a country school is generally a very difficult problem. There is an increasing number of claims by parents for compensation for accidents sustained by children in playgrounds, and if insurance companies are to accept the risks they will make it a condition that surfaces must be kept in better order. In country districts, where no suitable material is available, this will raise serious questions, especially where gradients are steep. In Devon 1 in 8 is not uncommon in the older playgrounds. No form of paving or gravelling would be suitable on such a slope; the former would be slippery, the latter would soon be washed off and become channelled by the action of surface water. Levelling causes heavy expenditure, involving in many cases the underpinning of buildings and boundary walls and the construction of retaining walls. The need of thorough underdraining, both for tar paving and gravel, is insisted upon, and I can fully endorse the point. The Report also mentions a complaint made by teachers of surface water being drained towards the middle of playgrounds; it is certainly better to form shallow channels near the sides, and they are not noticeable when walked over.

The question of *Enclosing Walls* as a screen from the street was the subject of divergent views, and the Committee express the opinion that it is impossible to lay down a general rule in regard to them.

Under *Equipment* it is pointed out that there is scope for more thought and ingenuity in making playgrounds attractive, and the planting of creepers, shrubs and flowers, and possibly trees for shade, is suggested. Where a master is a keen gardener much might be done in this way if the children could be trained to take an interest in their surroundings, but unless there is supervision the effect is not happy. Hedges, to dispense with walls or fences, are also mentioned, and I cannot see why it should not be possible to use them more frequently in country districts. Discipline at first ought in time to create interest in their preservation and upkeep by the children themselves; but, unfortunately, in practice if there is one device for enclosing a site which needs the protection of an unclimbable fence more than another it is a hedge, and I have had to remove

or protect many of them. In cases where they remain there are frequent complaints of trespass upon adjoining land.

Other Possibilities for town schools, such as the utilisation of blank walls for fives-courts, sandpits for infants, and the provision of gymnastic apparatus and swings, are mentioned, but the two latter are said to be unpopular with Local Education Authorities owing to the frequency of claims for compensation for accidents.

The subject of *Covered Sheds* brought out great difference of opinion, and the Committee state that it may very well be left to Education Authorities to decide whether a shed is necessary or not; but if provided, they point out that greater height appears to be necessary.

Covered Playgrounds formed by building on piers, leaving a space under the school, were condemned by most witnesses, and I think that one's experience of them fully endorses the verdict.

Recommendations as to Existing Buildings.—The foregoing notes refer to new schools, but it is the application of suggested reforms to existing schools which is likely to cause trouble, and certainly no alterations ought now to be planned without bearing the probable changes in mind. The essential points are the Committee's recommendations, which are briefly as follows:—

- (1) Every school should have space for physical exercises in the playground or an equivalent space.
- (2) After 1920 a playground allowing less than 10 square feet per child should be classed as "insufficient."
- (3) After 1925 a playground allowing less than 15 square feet per child should be classed as "insufficient."
- (4) Enlargement of buildings should not, except in unusual circumstances, be allowed if it would result in the reduction of a playground below the standard for new schools.* Reduction of the playground below these limits by the erection of buildings for special instruction should not be allowed.

With regard to space for physical exercises mentioned in the first recommendation, the size and organisation of the school would be the determining factor. "Equivalent space" is defined as suitable open space within five minutes' walk at the utmost from the school. It is not necessarily intended that the change indicated in Recommendations 2 and 3 shall become an immediate requirement by the dates mentioned, and it is pointed out that their enforcement depends upon circumstances of a very complex nature, but it is foreshadowed that the cumulative effect of several shortcomings should, as at present, decide the case.

If I have dealt at too great length with the subject of playgrounds I must plead their added importance at the present time.

VENTILATION AND HEATING.

Approach it as you may, you will find that any discussion upon school planning inevitably revolves around the problems of ventilation; and as I have pointed out, recognition of the need of healthier schools in this respect was the mainspring of the movement we are considering. On the one hand, theories as to the nature of the problems have undergone startling change; and on the other, public opinion regards with quickened interest the practical side of the question, stimulated no doubt by the campaign in favour of the open window and a knowledge of the benefits derived by patients in open-air sanatoria.

It is difficult for an architect to grasp the theoretical side of the situation in all its bearings, or to attach to these their due significance, because scientists disagree upon many points; but

* The full effect of this recommendation only becomes apparent when applied to individual cases, and it is to be hoped that the subject will be more fully considered before the recommendation is accepted.

the outstanding fact seems to be that what has been called the "chemical quality era" is likely to pass away if it has not already done so. Our old bogey carbon dioxide re-appears in the guise of a martyr whose reputation has suffered because of long association with evil companions. Dr. Leonard Hill has stated that even 300 to 400 parts of carbon dioxide per 10,000 parts of air have no considerable effect upon the human organism.* But if we do not regard it as an active poison, no one has suggested that we can afford to ignore its presence. What we are told is that we must look upon it as a valuable indicator which may be trusted to signal danger when occasion arises.

So, too, theories as to the percentage of oxygen have changed, and it is said that a deficiency of from 15 to 21 per cent. in the quantity normally present in the air we breathe is now known to have very little effect upon a healthy subject.

In another direction, bearing also upon ventilation, the results of experiments carried out by Dr. Rideal in 1908 in regard to the relative hygienic values of gas and electricity for ordinary domestic lighting led him to conclude that neither on chemical, physical, nor medical grounds does choice of the two systems depend upon hygienic considerations. Further than this it was found that "owing to the better ventilation obtained by gas, the products of combustion are not found in the air in anything like the proportion which might be expected."†

Then as to vitiated air, it is acknowledged that the exact ingredients which constitute harmful qualities are undetermined, and we are told upon high authority that there is no evidence whatever of the existence of any poisonous organic impurity in the air of crowded rooms.‡ Apparently it is the cumulative effect of several factors which causes the mischief.

Although it is undoubtedly interesting to watch the swing of the pendulum, we are sometimes tempted to ask whether the assistance which scientists afford us in ventilation is at present of much practical use, since it is destructive rather than constructive, but we must recognise the fact that in clearing the ground for further research they may be on the eve of far-reaching developments.

Although scientists at present cannot tell us precisely what ingredients make it harmful to breathe vitiated or stagnant air, we know by the effect produced that it is harmful. We believe further that the effect of breathing over-heated air is enervating because of some change undergone in the process of heating which chemical analysis fails to reveal. On the other hand, we know that movement of the air produces a feeling of freshness and buoyancy, and we are told that even though a low temperature may cause discomfort, as is often the case in open-air treatment of pulmonary diseases, the effect is nevertheless beneficial.§|| May we not be safe, therefore, in aiming at the supply, under conditions as favourable as we can make them, of abundant quantities of fresh air in a state approximating as nearly as possible to that in which it is supplied by nature?

As matters stand there appears to be general acceptance of the fact that movement, coolness, and a proper degree of relative moisture in the air are essential to good ventilation. What degree of humidity is requisite is a debated point, but Dr. Parkes and Dr. Shaw have both expressed the opinion that too much stress can be laid upon it. They point out that at very high and very low temperatures it is of great importance, and it is necessary under these conditions

* Paper read before the Physiological Section of the British Association, 1912.

† *Journal R. San. Inst.*, March 1908. See also "The Hygienic Aspects of Gas and Electricity for Heating and Lighting," Professor V. B. Lewes, *Builder*, 15th November 1912. "The Hygienic Aspects of Gas Lighting and Heating," Dr. F. S. Toogood, *Medical Magazine*, February 1911.

‡ Dr. Haldane.

§ "The Real Nature of the Problems in Heating and Ventilation awaiting Solution by the Engineer," Arthur H. Barker, 1st Lecture at University College, 17th October 1911.

|| In this connection it is interesting to read the remarks made by Dr. Boobyer in the discussion upon Mr. Saxon Snell's and Mr. Milburn's papers upon Hospitals, R.I.B.A. JOURNAL, 8th March 1913.

to have dry air, but at temperatures ranging from 55° to 65° they incline to the opinion that differences of humidity are not of great consequence.*

If diversity of opinion prevails amongst theorists, it is refreshing to find that in regard to school buildings there is almost unanimous agreement among school medical officers and school architects in favour of natural ventilation by means of the open window, and I make no apology, therefore, for regarding it as an accepted fact. There are, I know, conditions prevailing in some industrial centres which need special measures, just as there are school buildings which no conceivable scheme of natural ventilation would render fit for use; in these cases resort must be had to mechanical means, and a combined plenum and vacuum system is no doubt the best that can be devised for the purpose. Such a system is also essential for many public and other buildings. We know, for instance, what it has achieved in the large Examination Hall of Cambridge University,† but local conditions or the needs of unsuitable school buildings cannot be regarded as the determining factor for general application, and it rests with us to plan buildings to meet the requirements of the system we have adopted. I do not wish to decry the plenum system, nor is it necessary to recapitulate the points which are urged against it, I am merely dealing with recent developments, and these point in the direction I have indicated.

We must not lose sight of the fact that in natural ventilation the personal factor is an important one and much rests with the teacher; but any system will fail if misused. There is marked change of attitude already in these matters, and its effect will be more noticeable as time goes on. It is interesting to read, for instance, in the Annual Report of the School Medical Officer for Westmoreland‡ that in some schools a sanitary squad is told off during the "intervals" to assist the teacher in his endeavours to rid his school of stagnant air.

There are certain conditions necessary to successful natural ventilation which one should regard as axioms. I will state them briefly first of all, and discuss them afterwards:—

- (1) There must be suitable means of direct cross-window ventilation.
- (2) Windows must be kept open during school hours as fully as circumstances permit, and all windows must be thrown fully open thoroughly to flush the rooms during intervals, and before and after school hours.
- (3) The direction of the wind must be studied and action taken accordingly.
- (4) The walls, ceilings, and furniture must be kept at a suitable temperature.
- (5) Incoming air must be tempered only, not heated.

(1) I have placed cross-ventilation first on my list because it is the essence of the whole matter; we want windows on both sides of the room to create movement of the air. These may be arranged as in the Staffordshire type of school, where double-hung sashes are used on both sides of the room; the lower parts of the windows to the right of the scholars open on to a verandah, the upper parts are carried above the verandah roof. Hopper ventilators are provided on both sides of the room, delivering at a height of 6 feet above the floor line. In the Derbyshire type, where bi-lateral lighting is adopted, the principle is much the same except that fully exposed casement windows are used on both sides. A third plan is to have the main lighting windows on the left side of the children, and on the right inspection windows opening on to a corridor fully ventilated by windows; the roof of the corridor is kept low, and a range of clerestory lights, opening on centres into the open air, is placed above it. Hoppers are used in the same way as before. All of these systems have their advocates; I have found the last-mentioned work excellently in practice, and in very exceptional weather if the upper lights have to be almost closed the corridor provides a reservoir of fresh-tempered air supplied by these windows which are in suitable positions for the purpose.§

* *R. San. Inst. Journal*, April 1910. Discussion on the Rev. J. B. Lock's paper.

† Rev. J. B. Lock, *The Times*, 1st November 1912, and

R. San. Inst. Journal, April 1910.

‡ 1911.

§ See *Corridors*, p. 668.

It is necessary to emphasise the fact that for ventilation, if on no other grounds, it is not sufficient to have windows in opposite walls of a room unless the sills are low enough. I have dealt with numbers of rooms where there are windows on both sides with sills perhaps eight feet above the floor line. In these circumstances it is absolutely impossible to secure adequate ventilation by natural means under average conditions; the children are working in what is in effect a tank of stagnant air, and unless you can create movement of the air in the lower part of the room you cannot ventilate it. Lower the window sills, and you can achieve your object and improve the lighting at the same time.

(2) What can be done in the way of providing efficient ventilation by means of the hoppers only has been fully demonstrated by Dr. Reid in Staffordshire and by Mr. Widdows in Derbyshire.*† In Devon there are very few days in the year when it is not possible to keep any ordinary window open at least twelve inches without any special provision of hoppers and without feeling

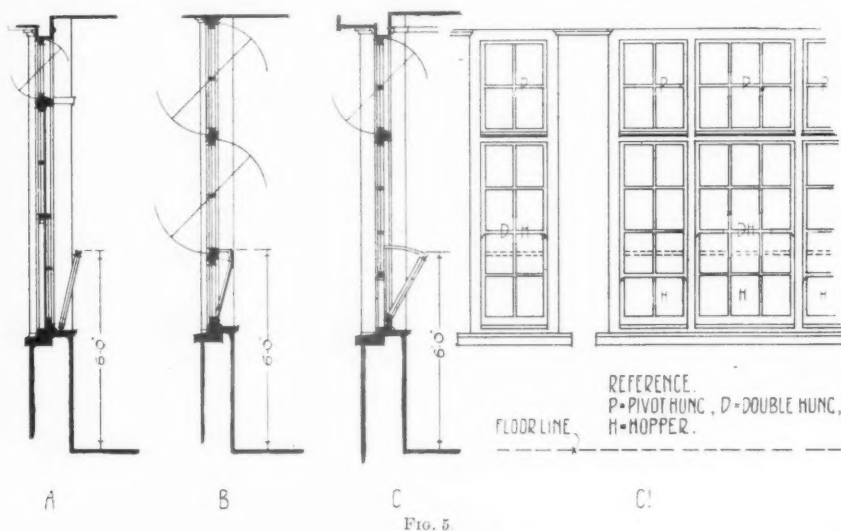


FIG. 5.

discomfort. In my own office with a north-west aspect, and warmed by an open fire-place, I have often kept them almost fully open throughout the day in mid-winter.

My staff do the same, and we can all speak of the good effect it has upon one's capacity for work. In fact, once you

have tried it you feel you cannot do without it. The same thing can be done in schools in a greater or lesser degree according to the climate if one is keen upon it. We should look to the windows to supplement the hoppers upon every possible occasion, and when the children are not in the rooms these should be regularly air-flushed by fully opening the windows.

(3) Next it is necessary to watch the direction of the wind and act intelligently by opening the windows on the sheltered side in boisterous weather. Even when it is calm and the sun is not shining the air pressure is unlikely to be the same on both sides of a building at any time. We know that light means heat, and different aspect would tend to create difference of temperature and so keep up movement.

(4) If rooms are to be warmed efficiently and economically, it is essential that walls, floors, ceilings, and furniture should not be allowed to become chilled, or there will be great waste of heat in restoring the proper temperature, and meanwhile the rooms will be draughty. In cold weather it is a mistake to keep windows and ventilators open when the rooms have been

* *Public Health*, November 1907.

† "The Planning of Schools with Special Reference to their Ventilation": Report by County M.O.H. Stafford-

shire. "Derbyshire Elementary Schools," R. San. Inst. Sessional Meeting, Derby, 25th February 1910.

thoroughly air-flushed after sweeping in the evening; they should be closed until just before the school opens, so that the temperature may be suitable when the children enter the building. Great assistance in preserving an equable temperature is derived from boarding and felting a roof, and no consideration of economy should allow its omission.

(5) The last point on my list is also important—we want to avoid heating the incoming air. It is not natural to breathe heated air, all we want to do is to temper it. Besides placing radiators under the hoppers, I have great faith in running a high-level pipe just under the clerestory windows and find the effect excellent. Adequate distribution and control of the heat and the necessity of having well-balanced circuits should not be overlooked.

Fig. 5 shows different types of *hoppers*; those used with casement windows should have ball catches to regulate, when required, the width of opening, and in exposed positions a baffling screen is useful, see C.C.¹. There are also several kinds of patented windows which are excellent in assisting ventilation, but I cannot speak from actual experience of their use.

In regard to outlet *ventilating flues*; in Devon we provide these on the ground floor of two-story buildings if classrooms open on one side on to a corridor, but in rooms which have windows on both sides opening into the outer air we are discarding them and find no ill effects.*

Flat ceilings with the window-heads carried up as high as possible are of great assistance to ventilation and are economical in cost.

Heating.—In winter there must be a considerable reserve of heat to draw upon if window ventilation is to be successful. We use low-pressure hot-water heating for most schools, and provide on an average about 18 feet superficial of heating surface per 1,000 cubic feet of air—this, of course, is varied according to aspect.† The normal working temperature of the water in the boiler is round about 160° Fahrenheit, and that of the radiators averages about 145°. In addition to hopper ventilators, fresh air is brought in at the backs of the radiators, each grating having a clear area of about 72 inches superficial.

With hot-water heating it is a good plan to use a boiler which has a registered capacity about one-third in excess of the surface to be heated; it is economical in point of fuel consumption, leaves a reserve in hand for emergencies, requires less attention, and prevents overtaxing the heating system. A temperature controller is most useful, especially where a whole-time caretaker is not employed. Pipes and radiators are best carried on brackets, independent of the floor, to allow the space under them to be swept; for a similar reason the radiators should allow a brush to pass between the sections, and ventilating gratings should be removable. Channels in the floor can be avoided to a surprising extent by the use of stoneware pipe sleeves, provided small pits are left for jointing the heating pipes, and arrangements are made for withdrawing them. These pits and unavoidable channels should be closed down tightly with solid covers. The boiler and pipes in the heating chamber should be coated with non-conducting composition, and pipes in trenches should be packed in slag wool to prevent loss of heat. Modifications of the low-pressure heating system which successfully overcome difficulties of level of heating chambers and dips in pipes are worthy of study, and will facilitate the solution of many problems in the future.

The difficulty of comparing on the same basis tenders for heating contracts led me to adopt a tender form upon which heating engineers give the necessary information for the purpose. (see Appendix A). They work to the same specification, and have a plan given them showing the approximate position of the radiators and run of the pipes.

As to alternative methods of heating, we use warm-air grates or open warm-air stoves, as the

* The bacteriological results obtained from plates exposed to downdraughts from outlet ventilators at Broadstairs Convalescent Home for Children prepare one for the abolition of such ventilators in the near future.

† Bi-lateral lighting materially affects heating. 30 ft. super per 1,000 has been tried in Derbyshire and found insufficient if the hopper windows are kept open in severe weather.—S.M.O.'s Report 1911.

size of the room may require, for renewals or additions to small buildings. The external gratings of these should be removable and the air flues be accessible for sweeping. The gratings must also be kept well above the ground and away from gullies.

An interesting series of experiments has been carried out in Essex schools in regard to the "Heating of Schoolrooms by closed Slow-combustion Stoves burning Coke."* One of the conclusions arrived at was that under certain conditions it is possible to detect in the air of rooms so heated a very small amount of carbon monoxide gas. The maximum amount even under favourable conditions for its accumulation, viz. the overheating of the stove and the absence of ventilation, did not in certain experiments exceed one part in 66,000; and in no case of insufficient ventilation, or even when unsealed joints were used for the flue, did the amount of carbon monoxide gas exceed one part in 30,000—an amount so small as to be negligible as a

possible cause of ill health. I will quote one paragraph from the report which is significant: "No doubt some of the bad effects erroneously ascribed to the production of poisonous gases by closed stoves are really caused by an unduly dry atmosphere, the result of insufficient ventilation." Again in the Derbyshire Report†: "As we now have ample evidence that classrooms heated by hot-water pipes can be efficiently ventilated, there is no reason why they should not be adequately ventilated when heated by slow-combustion stoves. Properly constructed slow-combustion stoves, especially those with a descending flue, should not be altogether prohibited when there is through ventilation and under suitable circumstances."

I do not wish to draw any conclusion from this or to advocate the use of closed stoves, but in view of the strictures passed upon these it is evident we have not yet reached a state of stable equilibrium.

A new suggestion for warming schools has recently been put forward by the School

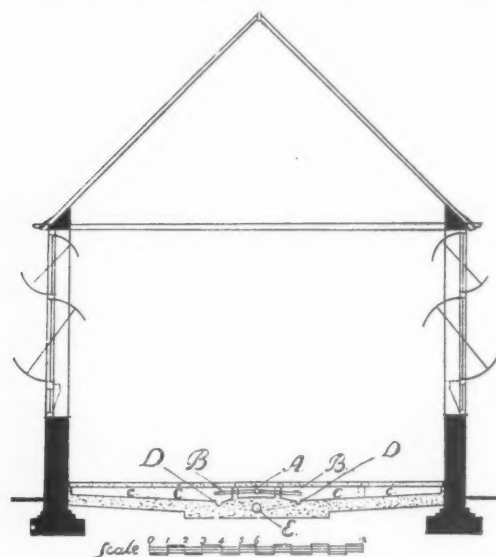


FIG. 6.—DIAGRAM SHOWING METHOD OF WARMING SCHOOL THROUGH FLOOR.

Medical Officer of Derbyshire, viz. that by warming the floors to a temperature of about 70° Fahrenheit by blowing live steam under them it might be possible to produce conditions approximating those of open-air schools. The air breathed by the children would be cold air, a few degrees higher in temperature than the external air, but each child would have the benefit of 10 square feet of radiating surface in close proximity to it. It is stated that a patent for the system has been applied for.‡ Fig. 6 shows the suggested arrangement; the idea is interesting, but one foresees difficulties in the way of its adoption.

PLANNING.

If we wish to follow recent developments in planning, we must first find out in what way changed conditions have affected the various units comprising a school building.

Classrooms.—First of all then, the requirements of Circular 709, issued in 1909, in regard to staffing have exercised marked influence upon the size of classrooms. Whereas a few years

* Essex S.M.O.'s Report, 1911.

† Derbyshire S.M.O.'s Report, 1911.

‡ Ibid. 1912.

ago most of the rooms were planned to accommodate 50 or 60 children, the practice is now becoming general to reduce the number to 40, with, perhaps, a few 48's for the lower standards where fluctuation in numbers is more frequent. Greater flexibility, too, in working the school is now possible, particularly if the classrooms vary slightly in size, since the grouping in one room of children belonging to a particular standard is no longer essential, it being recognised that the level of attainment of all the scholars in a standard cannot be equal, and that, therefore, there are children at the top and bottom of any group who may equally well be taught with others of higher or lower qualifications respectively. In other words the standard is regarded rather as a level of attainment to be reached before promotion, than as an inflexible unit for teaching purposes. Against this view it is urged that there is the danger of keeping back children who should be promoted, and *vice versa* of overtaxing children who are not sufficiently advanced. Nevertheless, it is a factor not without influence.

As to lighting, there appears to be growing difference of opinion between the merits of uni-lateral left-hand and bi-lateral lighting, or a combination of the latter with rear lighting. Continental experts condemn bi-lateral lighting almost unanimously. This is not a point which is within the province of an architect to decide, we can only await developments, and, as I have shown, there are grounds for further investigation.

In regard to glass area, too slavish faith has, I think, been placed upon its relative proportion to floor area. If a minimum area were laid down below which no classroom could be considered properly lighted, it would be a more logical proceeding than indiscriminately to apply a standard of, say, one-fifth in all circumstances. Aspect, surroundings, the width of rooms, atmospheric conditions, and numerous other influences must necessarily be taken into account.

Some discussion has also taken place as to the shape of classrooms, and there is a movement in favour of reducing the width in accordance with Continental practice. On the one hand, lighting is more evenly distributed, ventilation improved, and the angle of view from the teachers' desks reduced; on the other, the increased depth of the room may, it is said, add to the strain on a teacher's voice, and render it difficult for some of the children to see what is written on the blackboard. The additional length of the frontage, moreover, required for the building would necessitate more rooms being placed in the wings where possibly aspect may not be so favourable. With the smaller classrooms now in

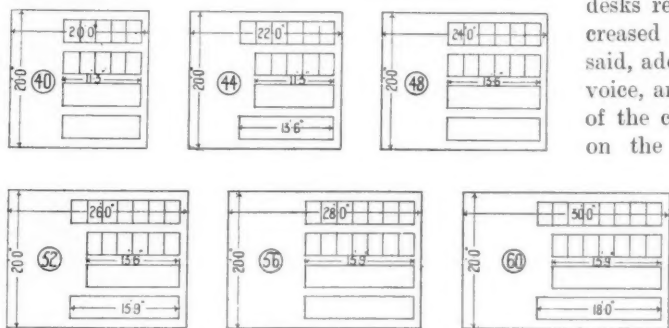


FIG. 7.—CLASSROOMS.

vogue, the first two objections do not appear serious, and there are further advantages in the adoption of narrow rooms, as will be evident from a glance at my diagram (fig. 7). It has been customary to use a room 24 feet 8 inches wide for classrooms accommodating fifty or sixty children; this means five and six rows of dual desks respectively in the depth of the room, and five desks in the width; intermediate numbers cannot be provided without waste of floor space. Now, with a width of 20 feet a series of rooms ascending the scale of accommodation by multiples of four can be provided without any loss of floor space. Similarly the cubical contents per head remain constant, which is not the case with the wider room, owing to the greater height required for lighting purposes. Without entering into discussion as to the sufficiency

or otherwise of the cubical area per head, I submit that any increase in this direction should be provided by additional floor area, and the reduction of the height of classrooms to 12 feet when not more than 20 feet in width. This height in my opinion is the best for ventilation. There is another point connected with narrow classrooms which is important; I refer to economy in roofing, because trusses are unnecessary.

Suitable colouring in regard to aspect and as affording variety must not be overlooked, and although its effect may be partly a matter of temperament, I am convinced it may exercise more influence than is generally recognised.

We must all have seen the appalling furniture in the shape of cupboards and other fittings, apart from desks, in the older schools, pitchforked into its place without any sense of fitness, and designed by some monster who at any rate evaded a conscience even if he was conceded a soul. We now see that the furniture of a room must be designed for its place when planning the building, and that it is as much a part of the general scheme as a door or a window.

Cross-ventilation I have already dealt with, and other phases of classroom planning remain much as heretofore.

Cloakrooms.—One result of medical inspection was to bring to light the extraordinary prevalence of pediculosis among elementary school children, and the influence of unsuitable cloakroom accommodation in fostering the disease. The primary cause is, no doubt, to be found in the homes, and obviously the first remedy should be applied there. Partial removal of the cause has already greatly reduced the percentage of cases. Under present conditions overlapping of clothes cannot be avoided, and the practice of allowing equal space for boys and girls is an anomaly. The former defect may to some extent be mitigated by the use of alternate long and short pegs recently introduced, but the remedy lies in giving more hanging space. The additional cost of such an increase in the size of cloakrooms has so far prevented its general adoption. The need of means of drying clothes is also urged as a pressing one, particularly in country schools. Thus the requirements of cloakrooms all point to the necessity of isolation and the banishment of any fitting which gives harbourage for dust or something worse, to the provision of adequate cross-ventilation and ample heating surface properly distributed.

A word of warning here may not be out of place. Some time ago I had an idea that the iron tubes used for cloakroom fittings might serve in the dual capacity of carrying the pegs and providing heat for drying purposes. Fortunately, before adopting it I heard of two cases where it had been tried and abandoned, owing to the intolerable smell caused by contact with clothes.

Lavatories.—If funds permit, it is an advantage to keep lavatories distinct from cloakrooms so as to be available for use if the latter are kept locked as they must be if cases of pilfering occur.

Corridors.—Changes in planning have also affected the width of corridors. The rule fixing the minimum width of these at 8 feet need not necessarily apply in all cases, and, if there is no question of assembly, their width is determined by the number of rooms they serve. If intended for use for ventilating purposes they should be provided with ample window area, and be shut off from possible sources of contamination.* Thus, one would now try to avoid cookery and cloakrooms, laboratories, &c., opening on to classroom corridors.

Assembly Halls.—It is now generally recognised that assembly halls as provided in the older schools were a comparatively useless adjunct, although curiously enough this discovery was made indirectly, objection being first made to them on the grounds that they interfered with the proper ventilation of the classrooms and could not in themselves be properly ventilated. Their position was chiefly due to a recommendation contained in the Board's "Building Rules," which still stands, but is no longer observed. In fact, both of the Departmental Committees I have referred

* See page 663, also figs. 21, 28, and 33.

to draw attention to the strong feeling against the former position of the hall. From the new point of view it should be so placed that it may be available during school hours for any purpose required without its use interfering in any way with the working of the rest of the school. Thus, it may be planned so that it can be used at separate times by more than one department; or, again, it may become a playroom in inclement weather, directly accessible from the playground, obviating the necessity of providing more than one covered shed for a mixed department, or it may do away with the need of such a shed in a single department.

Rooms for Medical Inspection.—Rooms for medical inspection with a waiting-room and lavatory attached are now provided in some schools. Where accommodation is limited they may no doubt be useful, but their provision is not at present customary.

Rooms for Dual Purposes.—The use of rooms for dual purposes is becoming general, *e.g.* if not required as centres for a district, cookery and laundry and light handicraft rooms may be used also as classrooms, and special desks are made for the purpose.* Fig. 8 shows such an arrangement. This plan is taken from an illustration published by a furnishing firm. A cookery-room may also be planned for use as a dining-room if required. The usefulness of the practice of deriving as much benefit as possible from each room was endorsed by the Departmental Committee on the Cost of School Buildings as tending to reduce the outlay upon new schools.

Shower Baths.—The provision of shower baths is attracting some attention, and several authorities have introduced them in recent buildings. Useful information as to these was given in a Paper read at the Sanitary Institute Congress in Cardiff in 1908 as a result of inquiries made by Drs. Kerr and Rose on behalf of the London County Council.† In the Annual Report of the Chief Medical Officer of the Board of Education the cost of providing twenty showers in the basement of a new building is stated to be, roughly speaking, from £200 to £300; and an independent bath house for a like number, £350 to £450. In special circumstances the Board are prepared to consider schemes for baths of this kind.‡

Playgrounds.—In view of the increase of motor traffic, exits from playgrounds delivering into the road direct, require some protection against a sudden rush of children. I have found an iron railing effective for the purpose, see fig. 8A.

Sanitation.—In sanitation trough closets have been entirely superseded by pedestal closets with independent flushing cisterns, without ball valves, usually supplied by a levelling cistern at

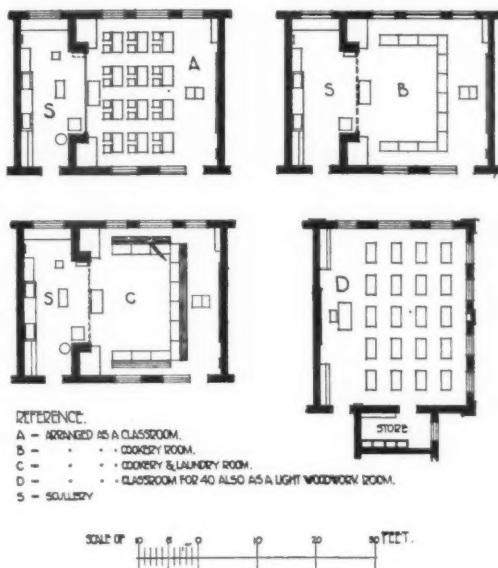


Fig. 8.

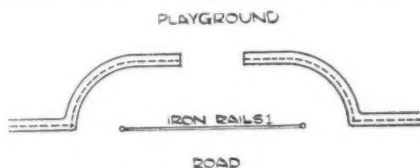


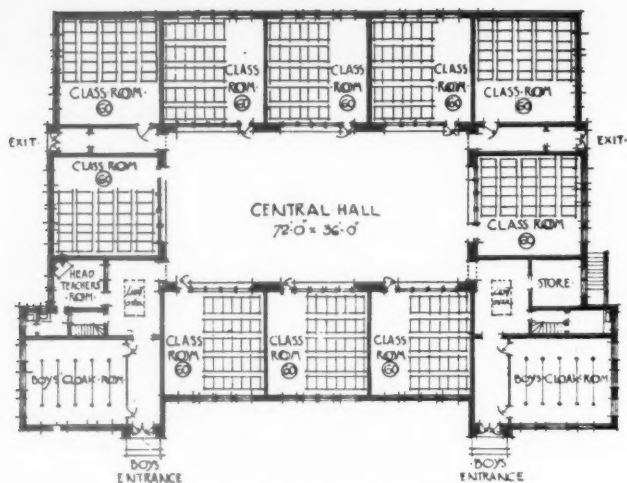
FIG. 8A.—PLAYGROUND EXIT.

* The *Arvon*, North of England School Furnishing Co.

† See also "Elementary School Planning," R. G. Kirkby, *The Builder*, 21st August 1909. *The Use of Shower Baths in England and on the Continent*, Dr. F. Rose (Churchill, 7

Great Marlborough St., London). *L.C.C. Report on School Bathing Arrangements in Germany and Holland*, Drs. Kerr and Rose (King & Son, Great Smith Street, Westminster).

† Annual Report, 1912.



GROUND FLOOR PLAN



SCALE OF FEET

FIG. 9.—CENTRAL HALL TYPE OF SCHOOL.

From the *Journal of the Royal Sanitary Institute*, illustrating a Paper on Derbyshire Elementary Schools by Mr. Widdows, 25th Feb. 1900.

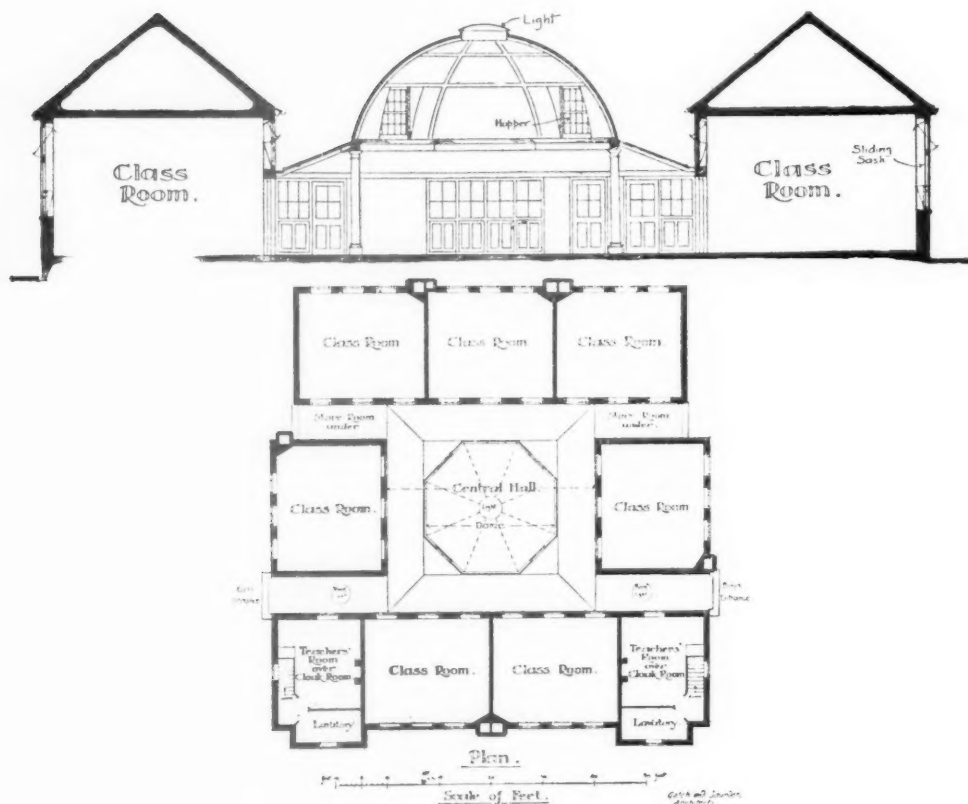


FIG. 10.

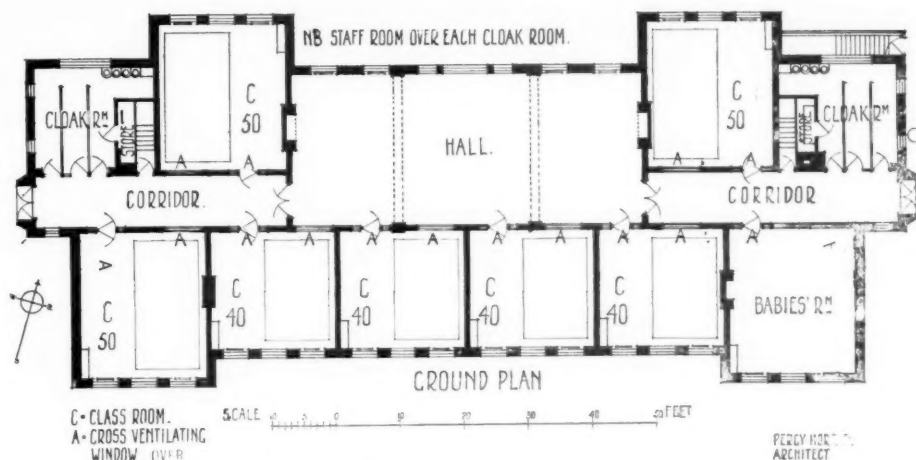


FIG. 11.—A ONE-STORY BUILDING, WITH ACCOMMODATION FOR 320 INFANTS.

the end of the range. The report of the Departmental Committee on intercepting traps is one more instance of the instability of principles which we have regarded as founded upon bed-rock, and, although inconclusive, gives much food for reflection.

Planning.—We may now glance at planning. Fig. 9 shows a central hall entirely surrounded by classrooms, a type of plan which has been much used in the past; proper cross-ventilation by natural means would be impossible. Fig. 10 is an interesting plan of a modified type designed to overcome the difficulty.* Other examples of central hall plans are shown in figs. 11 and 12,

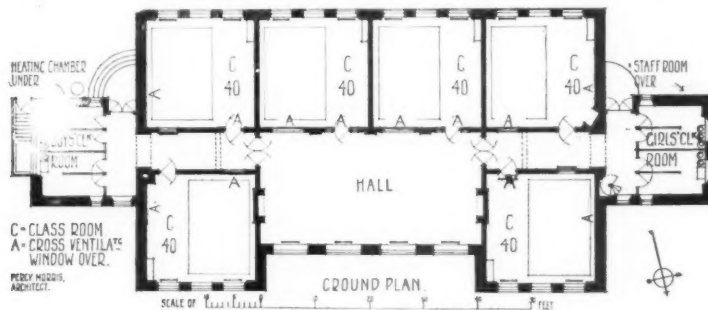


FIG. 12.—A ONE-STORY BUILDING WITH ACCOMMODATION FOR 240 JUNIOR CHILDREN (MIXED).

which provide cross-ventilation into the open air of all classrooms, but all of the foregoing are open to the objection that the hall cannot be used to the fullest extent compatible with present needs. You will notice that figs. 9 and 10 could only be used economically on a fairly level site, while figs. 11 and 12 were designed for sites sloping in directions at right angles to the frontage line.

As a result of general interest in the subject and the slackening of our fetters, planning is now tending in several directions, but is governed by the same guiding idea. Types may be roughly classified as follows :—

* See *Medical Officer*, 21st December 1912.

- (1) The Pavilion type (Staffordshire).
- (2) The Derbyshire type.
- (3) The External Corridor type.
- (4) The Central Corridor type.
- (5) The Quadrangular type.
- (6) Open-air schools of various kinds.

Fig. 13 shows the *Staffordshire type*, the pioneer effort in the direction of reform; a

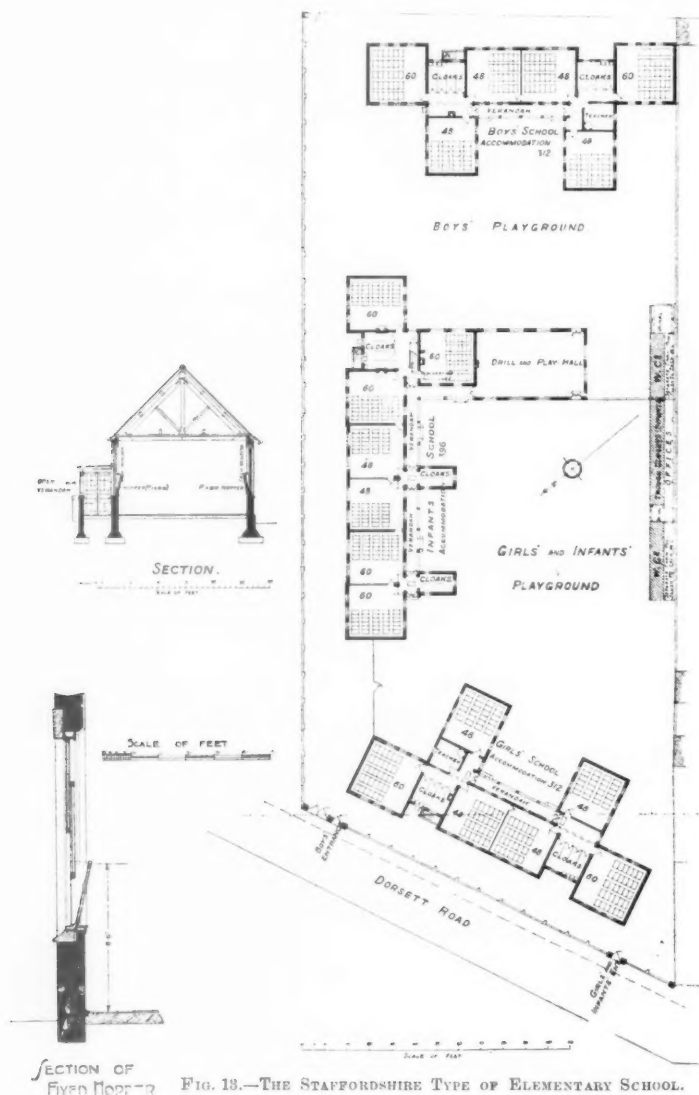


FIG. 13.—THE STAFFORDSHIRE TYPE OF ELEMENTARY SCHOOL.

verandah takes the place of the usual corridor, the classrooms are cross-ventilated in the manner already described. Separate cloakrooms are provided for groups of two, three, or four classrooms; access between classrooms for teachers is obtained by internal doors, and the hall is so placed as to be available for three departments.

(To be continued.)

THE ART OF ARCHITECTURE AND THE PROFESSION OF ARCHITECT.

By JOHN W. SIMPSON, I R.E., [F.].

THE abysmal and contented ignorance of the British architect of all that concerns the practice of his art in other countries than his own will not, we may hope, remain much longer a reproach as regards the younger generation. The formation of a Permanent International Committee, which brings the architects of twenty nations into personal contact, the display of Hulot's extraordinary "Restoration" of the Sicilian port of Selinus at the galleries of the Royal Water-Colour Society, the foundation of a British School at Rome on the lines of the Villa-Médicis, the enterprise of the Architectural Association in arranging an exhibition of the drawings of French students, with its accompanying visit of representatives of the Société des Architectes-Diplômés, and the writings and lectures of Blomfield and Ward, have aroused during recent years an interest in the work of our brothers in France which will surely extend to that of architects in other foreign lands.

The completion of Louvet's important work,* whose title suggests a neat solution of the old riddle, "Is Architecture a profession or an art?" now places in our hands exact and exhaustive information as to the whole training and practice of an architect in France; information which could hitherto be acquired only by residence abroad and long personal experience of the conditions. The author is an artist of repute, one of the three architects of the Grand Palais des Champs-Élysées, and a technician of the highest rank. The venerable Pascal, recalling his own early experience as one of the brilliant group who, with Louvet's father for their chief, worked under Garnier at the Opéra, finds in the work of the son the same clear-cut method, knowledge, and weight of technical experience which characterised that of the father.

The work, then, being so vouched, is of the first importance and interest to those concerned with

the planning and advancement of our national education in the art of architecture; here they will find set out for their information and for comparison with our own methods and intention the actual working results of a century's tradition in the systematic training of architect students. They will find too, perhaps to their surprise—for an entirely false view of French training obtains with us for the most part—a persistent emphasis laid upon the need for the development of the practical side of an architect's education. What will certainly surprise the English reader is Pascal's support of the author's plea for sound, and even advanced, general culture before technical training begins, on the ground that our hasty Anglo-Saxon methods are threatening to supplant the traditional education of the Latin race! "As if," says he, "the study of ancient languages were not the best of preparations, not only for the formation of judgment, taste, and intelligence, but even for the acquirement of modern tongues. I have read," he adds, "with pleasure this simply stated defence of methods which have received the sanction of centuries."

The same disquiet is shown by M. Louvet himself in his Introduction. He points out that during the last fifty years or less the exercise of the profession has been greatly changed. By reason of the incessant discoveries of science and their application to building, and of constantly increasing competition, the practice of our art has become more difficult and the acquirements necessary for an architect increase day by day; our studies become more complicated—if not more thorough—and the number of young men entering the profession grows alarmingly. He instances the fact that whereas thirty years ago some sixty to eighty candidates presented themselves for each entrance examination of the École des Beaux-Arts, and moderate efficiency ensured success, there are now some five hundred candidates; admission has consequently become far more difficult and uncertain. The qualifications proper for an architect having thus extended, the author insists upon the necessity for a thoroughly well-trained intellect which will give

* *L'Art d'Architecture et la Profession d'Architecte*. Par Albert Louvet, architecte diplômé par le Gouvernement. Avec Préface de J. L. Pascal, Membre de l'Institut. 2 vols. grand in-8o. Paris: Librairie de la Construction Moderne.

him a broad general outlook, prevent him from attaching undue importance to petty professional details, and enable him to judge largely, seize facts quickly and well, and be tolerant and eclectic while defining clearly his own artistic convictions. The point is a very important one, which may be recommended to the consideration of our own Board of Architectural Education in view of the present inadequate "Preliminary Examination" of R.I.B.A. students.

The work of M. Louvet, which has been received with enthusiastic approval by his brethren in France, is divided into two sections: the first dealing with the Formation, and the second with the Practice, of an Architect. The first volume opens with a study of what an architect of the present day should be and what he should know; followed by a consideration of how (1) the technical knowledge, and (2) the artistic qualities necessary to the formation of an architect may be acquired and developed. The next two chapters are concerned with the *École Nationale des Beaux-Arts* and the organisation of architectural teaching in France, with certain constructive criticisms thereon; followed by an account of the higher training in theory and design, the *Grand-Prix de Rome*, medals, travelling scholarships, and other rewards of a successful student's career. A chapter on the training of architects other than that of the *École Nationale des Beaux-Arts* brings the section to a close. This short chapter of eight pages, in a volume of 267 pages, gives some indication by its relative length of the overwhelming comparative importance of the National Academic School, to which all the principal schools of art throughout the country are affiliated; their students following the same course as at the Paris centre and the designs they produce being all sent to Paris, to be judged at the same time and by the same examiners as those of the students of the National School. A still more convincing proof of the predominance of the *École Nationale des Beaux-Arts* is the fact that although every Frenchman under thirty years of age is free to compete for the *Grand-Prix de Rome*, with its consequent honour and assured livelihood for the winner, no student outside the *École* has ever succeeded in taking it, or even in gaining admission to the final competition. Almost alone of eminent French architects, Ed. de Perthes, the author of the church of Sainte Anne d'Auray and the *Hôtel de Ville* of Paris, in collaboration with Ballu, did not owe his training to the *École Nationale*. His case is

still quoted as showing what may be done by extraordinary gifts, combined with tremendous energy and unremitting work!

Shall we ever have such a school? The Royal Academy makes no sign, and can claim no such exclusive concentration of high talent in its teachers and students as is required to place a great central school high above all rival institutions. The advance of outside schools is, in fact, sapping the position the Academy once held, and it may one day find itself outclassed by the growing activity of University and State-aided enterprises. The Royal College of Art, under some keen-sighted and energetic Minister of Education, may perhaps turn from the propagation of "art masters" to the training of artists, and develop into the great National School with the State at its back; but the "atelier" system, which is the foundation of the French organisation, seems hardly appropriate to the independent and critical temperament of the British student. That young gentleman, though not wanting in energy, is not very prone to the hero-worship necessary to enthusiastic belief in his master and comrades; and without it the *esprit de corps*, which excites and sustains desperate rivalry between different studios, is lacking.

The question, too, of the singular facilities for obtaining commissions for important work, which are offered by the numerous open competitions in this country to anyone capable of designing it, has to be considered. It is quite doubtful whether students who have to earn their living by their profession will ever give the time necessary for scholarly accomplishment while they are tempted by such opportunities of obtaining immediate and comparatively lucrative employment on actual building.

The reading of M. Louvet's book suggests many similar reflections on the difference, not only of the methods of education in his country and our own, but of the conditions of actual life which influence it.

In defining the gifts and attainments required of an architect nowadays, the author emphasises the need for those administrative qualities which, as he rightly says, have been often held in too little esteem by architects themselves. "The pretentious assertion 'I am an artist,' often made by those with little claim to the title, has been deemed a sufficient reply to critics; a fallacious position, which has done us much harm, since to be an artist is but part of being an architect." He adds,

caustically, that the idea belongs to a period when the artist (often very incompetent!) despised almost all his fellow-citizens, especially shopkeepers, contractors and the like, as "bourgeois"; professors and magistrates having also their exclusive castes, while all were themselves objects of the contemptuous disdain of the military class.

Having described the qualities which go to the making of a competent architect, and the means of forming him as regards both design and technical knowledge, M. Louvet proceeds to the second portion of his subject, which treats of the actual practice of the profession. This fills a volume nearly twice (pp. 468) the size of the first, and is divided into two Books, each of eight chapters; the first Book dealing with private practice generally, the second with the various public and official services in which so many French architects are engaged, and with public competition.

The author covers the whole field of architectural practice, and it is delightful to observe how the logically constructive mind of an architect has dealt with the mass of material before him. The book is as orderly as a specification, while its literary quality informs the most technical detail with interest.

In so rich an orchard it is difficult to select fruit without feeling that better might be offered for the reader's tasting. Is he of a practical turn of mind? He will find herein recited all the mysteries of the "séries-de-prix," "rabais," "prix-en-demande," "mémoires," and all the other elaborate facts and fictions by means whereof builders' estimates and accounts are made up in France. Is he more interested in drawings than in quantities? Here are set out all the French methods, scales, and studies usual both for design and execution. The admirable "Code" of an architect's obligations as regards himself, his brethren, his clients and his contractors, which was drawn up by Guadet, is given in full. This "Code" must be subscribed by all postulants for admission to the two leading Societies of architects, and full information as to these and the other French associations is also given. The constitution and conduct of an architect's office, his remuneration, the preparation and administration of contracts of divers sorts for different buildings are described; the services of architecture attached to the Ministry of Public Instruction and Fine Arts; the "Bâtimens Civils," "Palais Nationaux," and "Monumens historiques," those of the City of Paris, the

Department of the Seine, and the provincial administration—all and everything pertaining to the "compleat architect" are told of in clear, unaffected, and readable narrative.

The profession of architecture is, of course, entirely free in France, subject to taking out a Government licence, which will probably be abolished before long in favour of an income-tax. No diploma or reference of any kind is needed in order to practise. The question of compulsory qualification and registration has long been debated there, as in this country, and with as little result; some architects defending the principle of absolute liberty, others holding that a diploma or certificate should be required of an architect as of a doctor or lawyer; others, again, proposing systems which shall combine freedom in principle while distinguishing competent, or rather educated, architects from the ignorant and incapable. It may be of interest to British architects to give Monsieur Louvet's very fair and temperate summary of the reasoning advanced in each case.

"It is," he says, "rather difficult in the present day not to bow to the word 'liberty'; but to the doctrine that any man should be free to practise a profession unfettered save by his own responsibility, there is the obvious limitation that his liberty must not be exercised to the injury of others. The physician must give proofs of his studies and qualifications before he can practise, since the public must be protected from the incapable and unscrupulous. The advocate must fulfil certain conditions before he is admitted to the Bar, if only that the litigant may be assured of the integrity and honour of the man to whom he entrusts his cause. Even with these precautions there are not a few indifferent doctors and dubious lawyers; yet who would claim absolute freedom for everyone to practise these professions? It would therefore seem, at first sight, reasonable to regulate and limit the architect's profession in the same way, so that the public may be informed as to those whom they employ. Our functions are important from many points of view: the architect is a constructor, and must look to the stability of buildings; he is a trustee charged with the pecuniary interests of his client; his buildings by their external design affect the appearance of a town; and in planning their interiors he performs in some sort a social duty. Good arrangement and planning imply convenient and healthy buildings of all kinds, and the development of land without waste and without loss of light and air. Why not, then,

close the profession to all but those who can show proofs of their studies and character?"

He continues: "The supporters of freedom, on the other hand, maintain that all capacity should have the chance of asserting itself; and that, so long as the architect is responsible for his work, the dangers of entire liberty are but small. Further, that building owners will prefer to employ architects with proper credentials, and the incapable will be automatically eliminated; and that even were the profession closed, its boundaries would be so wide as to include the unworthy, who would be none the more competent for having official registration. Finally, that popular feeling being against restrictions, the present freedom of the profession accords with modern thought. As regards the instance of such privileged callings as those of the doctor and lawyer, these are but survivals of ancient federations which would in our days have been based upon entire freedom, responsibility being sufficient to prevent its abuse.

"Others again suggest a compromise. The liberty of the profession is to remain untrammelled, but the actual title of 'architect' is not to be used except by those who have passed certain examinations, or who can offer other proof of adequate study. Thus freedom will be assured, but the public will be enlightened; and while general admission will be wide, the higher qualifications of diplomas and scholastic honours will still remain in another category. The three solutions suggested for this important question become of increasing importance in view of the ever-growing number of architects and the competition, especially in the provinces, of unqualified persons. The true architects demand protection from intruders who thrust themselves into their place by mere effrontery, politico-social support, or otherwise."

It all sounds very familiar; and it is interesting to find that M. Louvet pronounces strongly in favour of protection of the word "architect." "Leave the profession open to all," he says, "but reserve the title of 'architect' to those who can show a reasonable degree of the necessary technical knowledge. This solution of the question does not create a monopoly, and it guards public authorities and the public generally from mis-

conception." Moreover, in the author's opinion, it would not detract from the value of the diplomas and degrees already existing in France. These he proceeds to describe for the information of those who may wish to know how the professional standing of an architect may be ascertained under existing conditions.

I am greatly tempted to quote Monsieur Louvet on the subject of competitions, but must refer my readers to his book. I cannot forbear, however, to mention his entire disbelief in the possibility of effective anonymity in competitions. This is, of course, as he admits, owing to the French system of appointing juries instead of a single assessor as in England; and his views may be commended to the attention of those competitors who, impatient of awards which do not jump with their own convictions, clamour for many assessors instead of one. Let them not suppose that, if the principle gains ground, such juries will be composed of architects alone, even were that an advantage over the present system. Here, as in France, laymen will find their way on to the jury, and that in increasing numbers until, as there, the architects are often in a hopeless minority and the "jury" becomes to all effect and purpose our old friend the "Building Committee" of thirty years ago, from whose monstrous decisions we were saved by insisting on a professional assessor.

M. Louvet's book is indeed most valuable; so patently valuable that one wonders why no one has written it, or its counterpart, long ago in every civilised country. For the client, it is a manual of the whole procedure of building business; for the architect, it forms a standard of practice; for the Courts, it is a work of reference, showing exactly what architects of good standing accept as their duties, and how they go, or should go, about them. To those who wish to enter the profession is displayed the whole system of the various studies and methods available and proper; while to building owner and contractor alike are explained the other sides of their contract, their duties to one another, and the position of the architect who administers the agreement they have entered into.

An admirable book! Where is the Louvet who will write the like for England?

REVIEWS.

THE NEW DELHI.

East India (Delhi): First Report of the Delhi Town Planning Committee on the Choice of a Site for the New Imperial Capital. With Two Maps. Price 1s. 2d.
Ditto: Second Report regarding the North Site, with Medical Report and Two Maps. Price 1s. 3d.
Ditto: Final Report regarding the Selected Site. With Plan and Two Maps. Price 1s. 8d.

Published by H.M. Stationery Office.

Since the conquest of Sicily in the twelfth century and the establishment of a great and durable Southern empire by our Norman ancestors, and the building of Palermo as its capital, no such opportunity as the creation of New Delhi has occurred in which to give lithic expression to the principles on which both our Indian Empire and its Norman prototype were built up. The fact that we have so far successfully solved the difficult problems of dominion over varied races, with their diverse religious and social customs, makes it hopeful that in spite of past mistakes we are about to show India in the erection of its new capital that we appreciate the beauty of its indigenous arts, and will give full opportunity for their exercise consistently with the claims of science in the interest of health, and of economical organisation in the planning of governmental buildings. The result of this policy as pursued by the Normans in Sicily by the employment of Saracenic building construction and Greek decoration was the creation of a new, beautiful, and interesting architectural style.

While continental countries have been at work for nearly half a century, in Great Britain the science of town planning is barely ten years old; but although it has already produced a voluminous bibliography, we can recall nothing, as regards the preliminaries and general lay-out of a town, to compare in value (for the student) with the three Reports presented to the Indian Government by the Delhi Town Planning Committee, dated respectively 13th June 1912, 11th March 1913, and 20th March 1913, and issued as Parliamentary Blue Books. These reports are models of what is needed in all such cases—a veritable gold mine for the professional town planner. Here will be found embodied all the "Suggestions to Promoters of Town-Planning Schemes" printed in the JOURNAL of the Royal Institute of British Architects, Third Series, Vol. XVIII., No. 18, and published by the Institute as a separate Paper in 1911.

We might paraphrase the saying of Sir William Flower (the curator of the British Natural History Museum), that a museum was "a system of well-written labels illustrated by natural specimens," and describe these reports as six first-class maps, illustrated by a few pregnant paragraphs.

The First Report deals with the considerations governing the choice of a site; gives a general

description of Delhi and its neighbourhood; states that the flow of the Jumna River is from 100 cubic feet per second in the cold season to 75,000 cubic feet in ordinary flood-time, the flood causing all the land in the Delhi area below the contour line of 680 feet to be unsuitable for permanent occupation; that the estimated area of land required for the new city is ten square miles for the civil and 15 square miles for the military, in addition to the area for expansion; discusses the alternative sites available, the importance of land acquisition or control over existing property within the area, and concludes with a strong recommendation in favour of the southern site.

The Second Report is devoted to a reconsideration of the North or Durbār site, advocated by Sir Bradford Leslie in a paper read before the Royal Society of Arts in London, challenging the Committee's recommendation. The choice of this view was supported more or less by the English Press, but the Committee have had no difficulty (barring great waste of time and expense) in demolishing every argument advanced in favour of this northern site when compared with the advantages of the southern. Its maximum building area is about five square miles, without any provision for extension, and its adoption would involve nearly a million pounds sterling in excess of the southern site.

The Final Report deals with the town-planning of the selected or southern site itself. It refers first of all to the regrettable necessity of leaving the poor suburb of Paharganj, with its 15,000 souls, intervening between the old and new cities, and recommends the Government "to obtain such control over it that no detrimental private interests can be created."

The general principles to be observed are set forth as follows:—Foresight in providing for every requirement of the future; health, ample air spaces, and room for expansion. Beauty combined with comfort. Convenience of arrangement as well as communication; main traffic routes must be parkways capable of extension in width and length. Preservation of natural beauties—hill, wood, and water—and of monuments of antiquity or fine modern architecture. Space for recreation. Due regard to economy.

The special principles governing Delhi are the realisation of the dominant idea of a new Imperial capital, absorbing the traditions of all the ancient capitals, and destined to be the seat of a Government exercising peaceful domination and dignified rule over the traditions and life of India. The adaptation of the scheme to physical conditions chiefly centres on making the city suitable for a seven months' residence in a climate which varies during that period from a maximum shade temperature of 105° F. to a minimum winter temperature approaching freezing-point. Add to this a bad malarial record and violent variations in climate,

rainfall, and river flood, and the importance of safeguarding health is obvious. In describing the selected or south site the Committee observes that the panorama of the present city, the new city, and the monuments and cities of the past, stretching below to the river as seen from the ridge drives, should be one difficult to match for charm. This site is excellent, moreover, from the point of view of health. The Cantonment area will be to the south-west side of the ridge. There is scope for the fullest communication every way.

DESCRIPTION OF THE LAY-OUT.

The Government House, the Council Chamber, and blocks of Secretariats are the centre and motif of the whole lay-out, and are so placed on Raisina Hill as to command views of the new city on every side and to be viewed by all the inhabitants thereof. This Government site appears as a spur of the ridge itself. Behind the hill a raised forum would be built, flanked by the Secretariat buildings and terminated at its western end by the mass of Government House and Council Chamber, with its wide flight of steps, portico and dome, leading the imagination from the machinery of government to the moving power itself. The forum will be approached by inclined ways on its north and south sides. The axis of the main avenue centres (eastward) on the Gate of Indrapat, the site of the oldest of all the old Delhis. "Right and left the roadways go and weld into one the Empire of to-day with the Empires of the past, and unite government with the business and lives of its people."

Behind Government House to the west come its gardens and parks, flanked by the general buildings of the Viceregal estate. Beyond these again, on the ridge itself, is a spacious amphitheatre, to be made out of the quarry from which much of the stone for roads and buildings may be cut. Above this comes the reservoir and its tower. Across the main axis will run the processional avenue, terminating to the north in the new station, and to the south in the Cathedral. At the intersection of this avenue with the main axis a *place* will be formed, around which will be gathered the buildings of the Oriental Institute, the Museum, the Library, and the Imperial Record Office. To the south-east will be the park area, in which stand the ancient monuments of Safdar Jang's Makhbara and the Lodi tombs. This area can be developed gradually as the city expands and has need of public institutions of various kinds.

The axis running north-east from the Secretariat buildings to the station and towards the Jama Masjid will form the principal business approach to the present city. At the railway station another *place* will be laid out, around which will be grouped the banks, shops, and hotels, with the post-office in symmetrical relation

to the station. To the south-west of the station will lie the houses of the local administration and the residences of the European clerks. Between Talkatora Garden and Paharganj will be the area for Indian clerks, the Press, and other Government establishments. Due south of the forum is placed the residence of the Commander-in-Chief.

Round the Viceregal estate and the forum the residences of the Members of Council, the Secretaries, and other officials of the Government of India are to be grouped.

To the south-west of Government House the club will be situated. To the south of the club a low ridge divides the tract into two portions. That to the west is well adapted for a golf course, while the eastern side is designed for a racecourse, the ridge itself offering unusual facilities for locating stands and seeing the races.

The fire station, with its tower, will be built to balance the lofty observatory buildings of the Jantar Mantar in the position shown on the plan.

The avenues range from 300 feet to 60 feet, with the exception of the main avenue east of the Secretariat buildings, where a parkway width of 440 feet has been allowed. The widths of the avenues depend on the varieties of trees selected. In all main avenues it is proposed to arrange for running water with fountains at intervals as features. The principal avenues, in addition to the main avenues, enclose the Imperial centre and are the outer main sinews of the frame. The commemorative column, lying on the axis, is the focal point of the roads and avenues on the parkway. A ridge-drive, as shown on the Committee's plan, will be laid out.

Communication with the present city and civil lines will be by way of the avenue towards the Jama Masjid. Inside the city this bifurcates, one branch leading towards the King Edward Memorial, while the other goes north towards St. James' Church and the Kashmere Gate. The present civil station and the new city will also be connected by broad roads running through the Sadr Bazar.

Provision has been made for parks in the following places:—

The Viceregal estate.

The parkway from Indrapat to the Secretariats.

The park round the Lodi tombs and Safdar Jang's Mausoleum.

The park area to the south of the club, containing the golf links and racecourse.

The park between the new and the present city, roughly 1,000 yards in width.

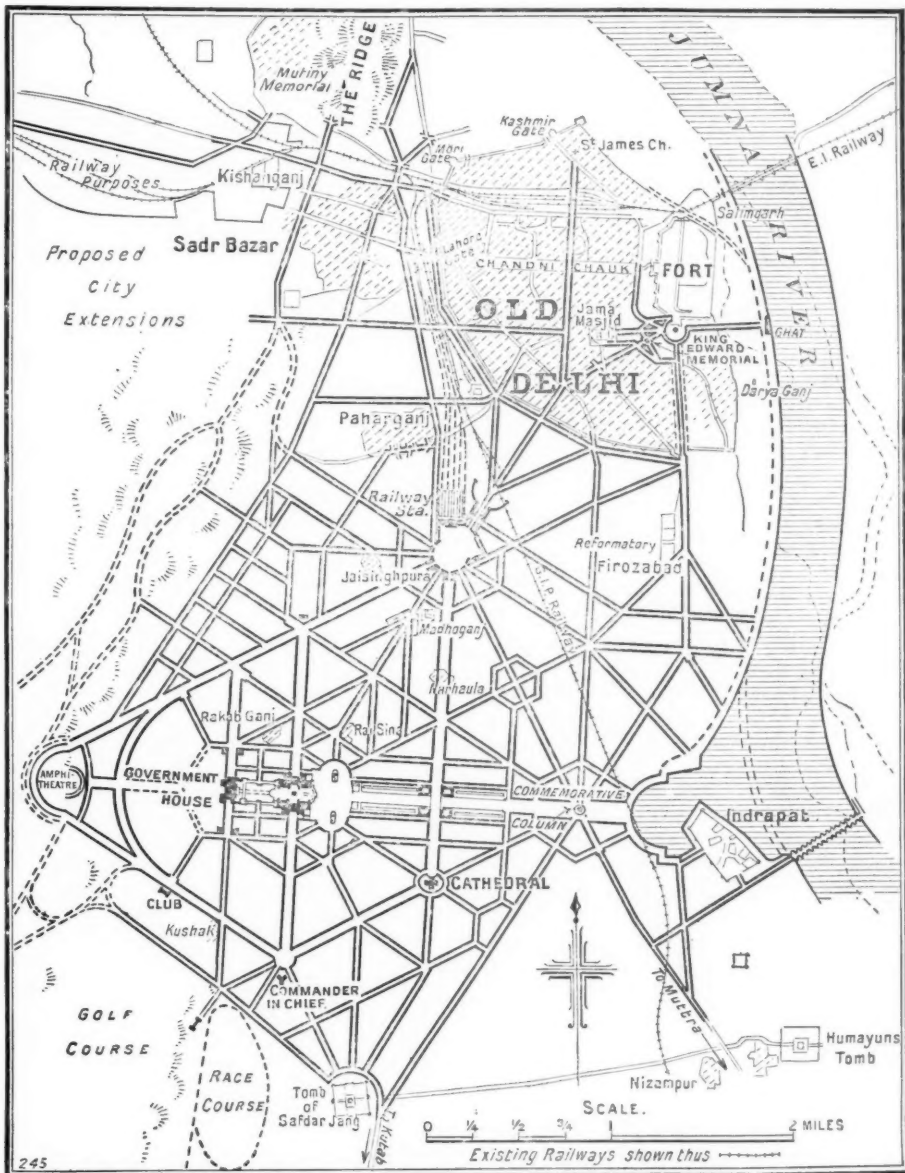
The afforested ridge.

The lay-out has been designed within lines of deviation so as to give the greatest possible freedom, and provides for a city on a ten-square-mile basis; but the alignment of avenues and roads is equally suited to a restricted lay-out

of the nature that was considered for the north site, namely, an area of about five square miles. The lay-out has been made independent of the lake effect.

The Report contains recommendations as

to water supply and irrigation, storm and sewage drainage, railways, road construction, tramways, through traffic routes, parks and open spaces, arboriculture, river treatment and water effects, and future development, as the outcome



MAP SHOWING THE SITE OF THE NEW INDIAN CAPITAL.

From *The Times*, by permission.

of the information given in the two previous Reports and supplied by the Government staff of experts, civil and military engineers and surveyors, medical officers of health, statisticians, &c.

In the future health statistics of a city designed in this manner India will possess a practical demonstration of the value of scientific sanitation which should go far to remove the present inertia existing among the uneducated natives.

Space does not permit of our quoting as largely as we could wish from this part of the Report. It is all of great interest and necessary to a grasp of the scheme in its entirety. The following particulars may be noted as of special interest.

Water Supply.—The drinking-water supply will be from the Jumna River, just above Delhi.

Disposal of the sewage is to be by means of an irrigation farm area on the Bela, south of Indrapat, and the ventilation of the sewers by surface gratings in manhole covers where roads are wide and areas not closely built upon. The Committee advise that *all* drains and sewers, without exception, should be maintained at public expense, that the whole of the sewage should be water-borne, and that the roof-water be taken into the house drains to assist in flushing the sewers. Also that the Liverpool system of flushing all the house drains four times a year be adopted, and that by payment of a small fee any householder may have his house drains flushed at any time.

Railways.—In addition to the present five stations a new terminal station is to be provided centrally between the old and new cities and the Cantonment, and into which every passenger train arriving at Delhi will run, whether on the broad or metre gauge. The traffic to and from the new city and the Cantonment will, it is estimated, justify the necessary expenditure by the various companies, and the lines are to be kept low enough to prevent the need of bridges, which, with their sloping approaches, so often destroy the road vistas and are ugly in themselves.

Roads.—The reasons for the divergence of existing traffic roads through the main areas are given, and the great importance of limiting the width of the wearing surfaces of new streets to a minimum is emphasised. It is advised that in every case the roads in the new city should be finished in impervious material of a bituminous character, on account of the frequent repairs and cost of watering involved for water-bound macadam, where dust is so prevalent and so prejudicial. An effort will be made to trap and retain dust, possibly by lowering the grass-margins adjoining the roadways; and it is further suggested that these grass-margins might be so arranged as to be occasionally covered by irrigation water, permanently entrapping the dust and adding it to the soil. In the interests of appearance the main avenues are to be graded in disregard of the smaller irregularities of the existing ground, avoiding as far as possible

convex surfaces in longitudinal section, and the cross-fall in asphaltic macadam roads is not to exceed one in forty-eight. The method of lighting will be by lamps suspended across the roadways between columns concealed as far as may be among the trees.

No tramway routes are suggested for the new city, the Committee evidently sharing in the anticipation of motor-omnibus services superseding trams. Ample width of main roads is, however, being provided should this forecast not be verified, and though not made too wide at first, no traffic possible in the future can congest them. If the frontage lines and all permanent structures are kept well back, roadways can cheaply be widened whenever required. Where crowded roads intersect ample space will be allowed.

Parks and Open Spaces.—There is plenty of space for parks and smaller recreation grounds, and, if planted as early as possible, may for many years be left in a wild state, dustless and pleasant to the eye. It is pointed out that before the avenues are planted it is essential to determine the design of the buildings, as buildings and trees are dependent on one another for effect. Both the size and shape of the trees in avenues are important, and the Committee have selected thirteen kinds out of a large number available, and these are to be grown in readiness. A deviation from the kind of tree selected to suit each avenue means a loss of a large general effect, which in New Delhi ought to be very fine.

River and Water Effect.—The plan shows provision for an improved and healthier river frontage from Wazirabad on the north to below Indrapat (a distance of between seven and eight miles) by raising the level of the Bela above the permanent lake level at Indrapat. To provide material for this and levelling-up areas within the city an ornamented bay or lake would be formed at the river or east end of the main avenue. The cost of this river-training and pool formation is estimated at £250,000.

The Report closes with the expression of the Committee's satisfaction that they have been in personal touch with most of the members of the new Committee appointed to carry out the actual task of constructing New Delhi. They can, therefore, count on continuity.

This information is largely embodied in the plans, which include:—

First Report.—1. Inch scale of present Delhi and its neighbourhood, coloured to show the physical features; 2. Ditto, coloured to show land acquisition proposals.

Second Report.—1. Two-inch scale of present Delhi and its vicinity, coloured to show the areas subjected to flood, &c. &c.; 2. Ditto, showing diagrammatically the depth of subsoil water, the comparative prevalence of the various species of

mosquitoes, and the percentage of enlarged spleen in children in the various areas.

Final Report.—1. Four-inch map (1912) showing the lay-out of avenues and roads; 2. Ditto, ditto, showing the alignment of main sewers, rising mains for drinking and irrigation water.

Contour lines at every five feet are clearly figured on the four-inch scale maps attached to the Final Report.

There are also plates of cross-sections of the proposed main axis or parkway, 440 feet wide, of typical avenues 300 feet and 150 feet wide respectively, and of a 60-foot road. The Final Report gives no calculation as to cost, but it is to be hoped that no considerations of outlay will be permitted to interfere with an adequate realisation of the scheme.

We should have welcomed photographic views of ancient Delhi and its principal monuments, many of which form the terminal features of the principal new avenues, but these can probably be seen among the productions of the Archaeological Survey of India.

W. H. SETH-SMITH [F.].

FIRE PROTECTION.

Fire Protection in Buildings. A Practical Treatise for Engineers, Architects, Surveyors, and Property Owners. By Harold G. Holt [A.] 8s. Lond. 1913. 8s. 6d. net. [Crosby Lockwood and Son, 7 Stationers' Hall Court, E.C.]

Mr. Holt has prepared an interesting book. He frankly confesses, however, that it is the outcome of various magazine articles and is avowedly a compilation of facts. He has ranged over a wide area. There is an introductory chapter on the work of the British Fire Prevention Committee. Subsequent chapters are devoted to Fire Extinction, Fire-resisting Construction, and Public and other Regulations on fire matters. There are also various illustrations of modern methods of fire-resisting construction to be seen in the case of Selfridge's in Oxford Street, Whiteley's in Westbourne Grove, the Woolworth Building in New York, &c.

A reprint of magazine articles usually results in no very exhaustive treatment of any subject. Mr. Holt exhibits this fact in his work. He only touches upon a few of the salient points of his subject, and it is apparent that he has not had facilities for checking and correcting some of the statements he makes. It would be invidious to comment too closely upon these points, as he has done a great service in calling attention, perhaps quite unintentionally, to the serious disadvantages under which the architect as well as the property owner suffers in the matter of fire protection.

The architect may desire to safeguard his buildings from fire, and may desire to use the best materials and to build in the best possible manner. The owner may also desire to preserve his property

and usually to spend his money wisely. They will both have little difficulty in settling the best plan, and possibly the best design and decoration, but when they arrive at the question of the effect of the adoption of any particular kind of construction, the position of the building under consideration, or the use when erected, upon the fire risk as measured by the fire premium, they have little or no guidance. Mr. Holt plainly emphasises this point when he states that certain rebates are allowed by the Fire Offices for various specified forms of construction, but this is confidential information only for the Fire Offices.

Those who have to deal with the property to be found in crowded districts, know too well the difficulty in dealing with building schemes in the absence of any approximate information of the burden of fire premium.

It is to be regretted that the Fire Offices of this country do not frankly take their best customers into their confidence, as do the offices in America. The Universal Mercantile Schedule issued by the American Offices gives in the closest possible detail exact particulars of the fire value of every kind of construction. Where dangerous elements occur it is shown how the risk may be brought down to a normal figure. At the present time, when efforts are being made to devise economical rural dwellings and school buildings, it would be no doubt a valuable factor in considering the possibilities of certain materials if such a schedule were available in this country. Its absence prevents the proper use of new methods and the development of new ideas, as those most likely to be interested are not prepared to embark on novelties without some definite return.

Mr. Holt also indicates the unfortunate conflict of opinion between local authorities and insurance experts on such questions as the construction and arrangement of doors provided to protect openings in party walls. For instance, it is not certain that anything beyond iron doors may be used in London as a compliance with the Building Acts. Anything else must form the subject of special and particular enquiry by the London County Council. This obtains, although there have been in use for years several types of doors which have been scheduled by the practical experience of the Fire Offices as equivalents for the same purposes as those covered by the Building Acts.

The British Fire Prevention Committee are doing a useful work in testing various materials, but a far more useful and practical work could be done if there could be some direct association between such a body, the large local authorities, and the chief Insurance Offices.

If Mr. Holt should issue a second edition of his book, he will no doubt wish to make several amendments and corrections. The schedule of fire-resisting materials in the Appendix II. is out of date, as it was repealed eight years ago. The

statement at the bottom of page 58, that the Factory and Workshop Act, 1901, and London Building Acts Amendment Act, 1905, provide regulations for the plan and construction of staircases of various types, needs modification, as neither of these Acts provide such regulations. What Mr. Holt has evidently had before him has been the list of suggestions issued by the London County Council for means of escape. The Appendix XIV. might well be omitted, as anyone capable of making use of the book would not be likely to need an explanation of such elementary terms as "Deflection," "Flange," "Gutter," "Riser," "Sash," &c.

CHAS. A. DAUBNEY [A.].

LIVERPOOL STUDENTS' DRAWINGS.

The Liverpool Architectural Sketch Book: being the Annual of the School of Architecture of the University of Liverpool. Edited by C. H. Reilly. 40. Lond. 1913. [Architectural Review, "Caxton House, Westminster."]

The Liverpool Sketch Book is an exhibition in miniature, and takes the place, as Professor Reilly suggests in his happily worded Introduction, of an annual show of students' drawings for those who cannot get up to Liverpool. The Book is divided into two parts, measured drawings of such work as St. George's Hall, L'Ecole de Médecine, Manchester Old Town Hall, the Propylæa at Munich ("even the youngest architect," says Prof. Reilly, "may profit by the work of the masters"), and, secondly, original designs, of which about half are solutions of subjects set for the Institute Final Testimonies of Study. Almost all the work shows the delicacy and repose we have learnt to expect from Liverpool. Particularly pleasing are Mr. Sykes' War Memorial, Mr. Dod's Wall Monument, Mr. Prestwich's Ball Room, and Mr. Weekes' Screen Colonnade. And there are some sheets of composition of full-size details which the School has the art of making peculiarly attractive. One criticism that suggests itself is that elevation is thought more of than plan. Next year it would be interesting to see one large planning scheme worked out.

W. G. NEWTON [A.].

Books Received.

The Theory and Design of Structures: a Text-book for the Use of Students, Draughtsmen, and Engineers engaged in Constructional Work. By Ewart S. Andrews, B.Sc. Third Edition. 80. Lond. 1913. 9s. net. [Chapman & Hall, Ltd., 11 Henrietta Street, W.C.]

Further Problems in the Theory and Design of Structures: an Advanced Text-book for the Use of Students, Draughtsmen, and Engineers engaged in Constructional Work. By Ewart S. Andrews, B.Sc. 80. Lond. 1913. 7s. 6d. net. [Chapman & Hall.]

The Clerk of Works: A Handbook on the Supervision of Building Operations. By George Metson, Licentiate R.I.B.A., Author of "The Builder's Foreman" and "Quantity Surveying." 80. Lond. 1913. [Crosby Lockwood & Son, 7 Stationers' Hall Court, E.C.]

Homeland Handbooks.—Bath Abbey: Its History and Architecture. By Edwin Morcombe Hick, Licentiate R.I.B.A. 80. Lond. 1913. 2s. net. [Homeland Association, Ltd., Chandos Chambers, 15 Bedford Street, Strand.]



9 CONDUIT STREET, LONDON, W., 30th August 1913.

CHRONICLE.

Main Roads in Greater London.

As a result of the recent deputation from the Institute to the Prime Minister [see JOURNAL, 26th July, p. 641] Mr. John Burns, at the request of Mr. Asquith, has consented to preside at a Conference of local authorities and others interested in the improvement of arterial road communication in Greater London. Mr. Burns proposes that the Conference should take place in the autumn, but the precise date has not yet been fixed. All the local authorities of the Greater London area have been invited to send representatives to express their views in regard to the matter or any particular aspect of it.

The Admiralty Arch Approach.

Since the publication of the last number of the JOURNAL the long-pending question of the Mall to Charing Cross improvement in relation to the Admiralty Arch has been settled, the London County Council having agreed to a recommendation of its Improvement Committee that the approach to the Arch should be of a minimum width of 90 feet, and that the architectural treatment of the buildings at the entrance should be worthy of the position. It will be remembered that a conference of representatives of H.M. Office of Works, the London County Council, and the Westminster City Council was arranged to inaugurate a joint scheme for the improvement, the President of the Royal Institute representing the Office of Works with Lord Plymouth and Mr. Lionel Earle. The Improvements Committee in their Report mention that "various proposals for the completion of the improvement were prepared and considered by the Joint Committee, who state that in their deliberations they have been greatly assisted by the experience and advice of Mr. Reginald Blomfield, A.R.A., President of the Royal Institute of British Architects, one of the members of the Joint Committee." The scheme involves (1) the acquisition of the site of No. 56 Charing Cross and parts of No. 55 Charing Cross, and No. 17 Spring Gardens (Liverpool and London and Globe Insurance Company); (2) the acquisition of No. 57 Charing Cross and No. 15 Spring

Gardens (Phoenix Insurance Company); (3) the acquisition of Nos. 58 and 59 Charing Cross (Messrs. Anderson's premises) and the premises in the rear (Nos. 11 and 13 Spring Gardens). Parliamentary authority will have to be obtained for the compulsory acquisition of such interests (if any) as cannot be acquired by agreement. The cost of the scheme is estimated at £115,000, and the Government, the County Council, and the Westminster City Council will each contribute a third. The Improvements Committee expressed their full agreement with the Joint Committee as to the merits of the scheme suggested, which will, they consider, provide a dignified approach to the Admiralty Arch and at the same time secure for the adjoining buildings architectural treatment worthy of the exceptional position which they occupy.

Designs of New Government Buildings.

On the Public Buildings Expenses Bill coming up for consideration on report in the House of Commons recently, Mr. Bennett-Goldney moved an amendment in favour of throwing open to public competition the designs for the proposed new buildings that are not completions to existing blocks and leaving the choice of the selected designs to the First Commissioner, with the assistance of a body of persons equally competent to adjudicate upon architectural questions of the kind, the architectural staff in the Office of Works being permitted to compete. He said it was proposed to spend £145,000 of public money upon public buildings, but no vestige of any design had been presented either to the House or to the Department which was responsible for the spending of the money. The time had come when they ought to insist upon the designs of great public buildings being thrown open to competition. He believed if the First Commissioner of Works would only combine with the Royal Institute of British Architects and the Royal Academy he would easily be able to bring together a body of men to adjudicate fairly and squarely between the different designs.

Mr. Wedgwood Benn said the proposed buildings were not very big or expensive, and although it was the practice of the Office of Works to throw open to competition large and important buildings, they also retained a staff of architects for the purpose of designing and carrying out smaller buildings of this kind.

The amendment was rejected by 254 votes to 90.

Mr. Bennett-Goldney on a subsequent occasion asked Mr. Wedgwood Benn if he would ascertain how many public buildings costing more than £15,000 had been designed by the permanent staff of the Office of Works since 1906, including only such buildings as had been built, were under construction, or had been sanctioned by the Govern-

ment to be constructed, and if he would give a list of these buildings.

Mr. Wedgwood Benn said he would send the honourable member a list of fifty-three buildings. In further reply he stated that the total number of architects of all grades on the establishment of the Office of Works was sixty-one. Of these three were Fellows, twenty-four Associates, and four Licentiates of the Royal Institute of British Architects. The three Fellows attained their rank in 1891, 1906, and 1912 respectively.

St. Peter's Square, Hammersmith.

The Secretary of the London Society writes:—"It is with the greatest satisfaction that the London Society learns that the Hammersmith Borough Council have at length decided to agree to the acquisition of St. Peter's Square. On behalf of the Society, I should like to thank all those members of the Press who in answer to our urgent appeal gave the matter such widespread and constant publicity. There is no doubt that but for their action the Square would have been entirely blotted out, and the result is a clear proof of the power of collective action which the London Society persistently advocates."

Ancient Monuments Preservation.

On the third reading in the House of Lords of the Ancient Monuments Consolidation and Amendment Bill, the following was adopted as the definition in Clause 22:—

"The expression 'ancient monument' includes any monument specified in the Schedule to the Ancient Monuments Protection Act, 1882, and any other monuments or things which in the opinion of the Commissioners of Works are of a like character, and any monument the preservation of which is a matter of public interest by reason of the historic, architectural, traditional, artistic, or archaeological interest attaching thereto, or any part thereof or any remains thereof, and the site of any such monument or of any remains thereof; and any part of the adjoining land which may be required for the purpose of fencing, covering in, or otherwise preserving the monument from injury, and also includes the means of access thereto."

The Bill passed the Commons without any amendment of importance and has received the Royal Assent. The provisions of the measure have already been drawn attention to in these pages by Mr. W. J. Davies [A.]—see JOURNAL 10th May and 14th June. The Act marks a great advance on any previous legislation on the subject in this country. For the first time means are provided of arresting the threatened destruction or removal of an "ancient monument" within the purview of the Act. There will be no reason in the future why such a building as Tattershall Castle, for instance, should be despoiled if the First Commissioner of Works, with whom rests the power of putting the law in motion, acts with energy and promptitude. A simple order of the Commissioner's will make any injury of such a place an

offence; time will then be given for deliberation on the future of the building, and its fate will in the last resort be determined by Parliament.

Preservation of Ancient Churches: A Committee on Protection.

In view of the recent discussion in the House of Lords upon the Bill for the Protection of Ancient Monuments, and of the report of the Select Committee on the same subject issued a few months ago, the Archbishops of Canterbury and York are desirous to ascertain what steps are taken, on the issue of faculties in the different dioceses, to secure due protection, on both archaeological and artistic grounds, for church fabrics which have to undergo repair or in which changes are being made. A committee has therefore been formed to undertake this inquiry and to report to the Archbishops the information acquired, together with any recommendations which the facts collected may suggest to the Committee. It consists of Sir Lewis Dibdin, D.C.L., Dean of the Arches; Sir Alfred Kempe, D.C.L., F.R.S., Chancellor of the Diocese of London, and of the Dioceses of St. Albans, Southwell, Peterborough, and Chichester; and Sir Charles E. H. Chadwyck-Healey, K.C.B., K.C., Chancellor of the Diocese of Exeter and formerly also Chancellor of the Dioceses of Salisbury and Bath and Wells; with Mr. E. V. Oliver, Ecclesiastical Commission, Millbank, Westminster, as Secretary.

Christchurch Priory: The Fallacies of Restoration.

The Times of the 26th inst. published a letter from Lord Ferrers, Hon. Secretary of the Society for the Protection of Ancient Buildings, calling attention to the danger which threatens the beautiful Lady Chapel of the Priory Church at Christchurch.

Not the least beautiful part of the church (writes Lord Ferrers) is the Lady Chapel. Eastward of the screen, behind the choir, the church ends in a work of three vaulted compartments, of which the first serves as ambulatory and the other two constitute the Lady Chapel. The first half of the chapel has tracery of what might be windows filled in blank; and the reason of this is obvious outside, for the space is delightfully half-smothered by extensions of the aisles. The second half is gloriously lighted north and east and south by three great windows of early Perpendicular tracery. The north and south windows are clear, but the east window is filled with nineteenth century coloured glass. Apart from this glass there is little to disturb the serenity of the interior, and the eye is soon caught and held by a canopied reredos, broken, alas! but so exquisite that its first perfection could hardly be imagined more beautiful. This chapel has been a delight for 500 years and might well remain so for another 500. But at this moment it is in danger of being killed by kindness. The vicar and churchwardens have accepted a bequest of the value of £5,600 to "restore" the Lady Chapel. The chapel is structurally sound and only measures about 36 feet by 21 feet. It is a small chapel, and it is a large sum. The interest on a tithe of it should keep the building in repair to all time. How will the capital be spent? The coloured glass might (if it could

be arranged) be replaced by clear at no great cost, and a pound or two might be spent on repairs to the tomb south of the altar. After that the money becomes dangerous. Fifty years ago it would no doubt have been used to "restore" the reredos. Christchurch may be backward in reverence for old work, but it is to be hoped that at least an atrocity such as this is impossible. And yet the trustees have accepted the bequest. Like a child offered a rich cake, they will be tempted to go through with it. And there is no practical use to which all this money can be put. It can only be spent to import ornamental modernisms. If it is spent, at the best it will be worse than wasted; at the worst, priceless beauty will be sacrificed for the trappings of an ecclesiastical furniture shop.

Lord Ferrer asks that the public be put on the alert to insist that only so much money should be spent as can be shown to be for the real advantage of the Lady Chapel.

The Times of the same date in a leader headed "Fallacies of Restoration" says:—

"Restoration" is a word that every lover of old buildings writes with inverted commas because, though it looks innocent enough, it has been used to cover a multitude of sins. It may mean merely the necessary repair of the decay caused by time; and it may mean what has happened in Durham, Salisbury, Worcester, and many other Cathedrals. Now a very small sum, as Lord Ferrers points out, would pay for all repairs needed in this little Lady Chapel. But if the vicar and churchwardens spend only that small sum, what will they do with the rest of their bequest? The danger is that they will feel bound, having accepted it, to spend it all; and in that case they can, unfortunately, find plenty of mischief to do. There is, for instance, the reredos damaged, but still most beautiful. That might have its niches filled with statues of the kind we all know too well. Then behind the chapel there are three fine windows, one already filled with modern glass. It would be well, as Lord Ferrers says, to put plain glass in this one window; but that would cost very little. The danger is that money will be spent on more stained glass and on other decorations which are pretty sure to spoil the beauties they are meant to enhance.

Now it is true that the windows were meant to contain stained glass and the reredos niches to contain statues; and it is possible, no doubt, to produce good stained glass now and good statues. But the better the glass and the better the statues, the less are they fitted for the windows and niches of the Middle Ages. William Morris soon discovered this; and, as soon as he discovered it, he refused to put his glass in old windows. Others have discovered it too; but too many of them, instead of trying to produce works of art for the buildings of their own time, have endeavoured by diligent imitation to make their work congruous with the buildings of the Middle Ages, and in aiming at this congruity they have missed everything else. There are instances of works of art that have also been closely imitative, as, for instance, the sculpture of Bastianini, but they are very rare. Nearly always close imitation prevents any kind of expression and only satisfies those who see no difference between real art and sham. And yet there is still a persistent belief that where, in our Gothic churches, we have lost the reality, we ought, if we can afford it, to supply an imitation. The other day, for instance, Mr. Olaf Carøe, writing about the windows in Winchester College Chapel, used these words:—"Specimens of the old glass exist as a fact, and as we must, unfortunately, have copies, let us have good copies, not plagiarism." But why must we have copies? A stained glass window, since it is a decoration, not a structural necessity, is a work of art or nothing; and a copy of a work of art is not the same thing as a work of art. Mr. Carøe says it can be exact; but if it can, then the original

is not a work of art; and, as a matter of fact, these modern imitations are very seldom copies of particular works of art. They are imitations of a style, and of one in which the imitator would not naturally express himself. He has to invent, yet under conditions which make invention impossible; and what he produces, therefore, is an imitation of invention, an artificial flower which is not even a copy of a real one.

The worst of this sham art is that, besides spoiling the real art of the past, it also hinders the production of real art in the present. Architects trained in restoration, when they have to design a new work, proceed as if they were still restoring; and sculptors and glass painters follow suit. Indeed, the public is so inured to restored Gothic that it has learnt to like sham Gothic better than real architecture in any other style. Gothic is commonly supposed to be the religious style of architecture; though nothing can be less religious than sham art of any kind, for no one would produce it if he were not paid for it. In the prime of Gothic religion found an expression for itself in architecture and all the subsidiary arts; but that expression was peculiar to its own time, as artistic expression always is. It came to an end when there was a change in the minds of men, and our minds are still further changed. Our business now, when we build churches, is to find our own artistic expression of our religion; and that, difficult anyhow, will remain impossible so long as we imitate an expression of the past. The old buildings satisfy us just because they are expressive, and not at all because they happen to be Gothic in style. But whenever we make our own imitative additions to them we lessen their power of expression and our own power of enjoyment.

Town-Planning Schemes: Local Government Board's Report.

The Local Government Board have issued the first part of their Annual Report for 1912-13 as a Blue-book [Cd. 6981]. The report is divided into three sections, and the issue of the Housing Section for the first time as a separate volume recognises the prominent position which housing takes among social questions.

As to town planning, the Report states that both landowners and local authorities are alive to the advantages which system is likely to secure in laying out land for building, and that town planning will be a source of large ultimate saving to the community in many directions. So far the schemes presented to the Board have been chiefly concerned with laying out main routes of communication through and from the areas dealt with; with the provision of open spaces; with the limitation of the number of houses to be erected on a particular area; with the setting back of the building lines so as to secure abundant air space and to enable roads to be widened hereafter at a minimum cost should circumstances render it necessary; with the restriction of factories and similar buildings to particular areas, and with the setting aside of particular sites for public purposes. Up to the end of March 1913, the Board had authorised the preparation or adoption of 33 schemes by 27 local authorities, involving a total area of more than 50,000 acres, or over 78 square miles. Four complete schemes have been submitted to the Board. Two were prepared by the Corporation of Birmingham; one by the Corporation of Rochdale,

and the other by the Urban District Council of Ruislip-Northwood. In the Birmingham scheme no attempt was made to regulate or control to any great extent the architectural features of the buildings to be erected. The Ruislip-Northwood scheme (which relates to 5,906 acres), on the other hand, contains architectural provisions. Among the schemes the preparation of which was authorised by the Board in the year 1912-13 may be noted one of 1,044 acres in Finchley, one of 4,266 acres in the borough and rural district of Luton, one of 1,860 acres in the urban districts of Twickenham, Heston, and Isleworth, and one of 1,530 acres in Walthamstow. In addition, 11 local authorities have applied for authority to prepare schemes involving some 20,000 acres, and the Board have information that some 111 others, many of them in the Greater London area, are considering the question of preparing town planning schemes.

Formation of an International Garden City and Town Planning Association.

At a conference recently held under the auspices of the Garden City Association, and attended by delegates from all over the world, it was decided to form an International Garden City and Town Planning Association, support having been given to this project by the various associations in this country. A Committee has been elected to make the necessary arrangements, Mr. Ebenezer Howard being elected the first President. Offices have been taken at No. 3 Gray's Inn Place, where meetings of the Committee will be held during the coming week. It is expected that the first International Congress will take place at Letchworth next year during the month of August. The new association will deal with everything in any way relating to town planning and garden suburbs in the widest sense.

M. Rodin's "Burghers of Calais."

A site for M. Auguste Rodin's sculpture, "The Burghers of Calais," has been selected in the Victoria Tower Garden, Westminster. The garden, which adjoins the Houses of Parliament on the Millbank side, is at present an acre in extent, and has a short walk along the side of the Thames. But the old houses and wharves which once stood between it and Lambeth Bridge have been pulled down, and the cleared area, bounded by an embankment wall on the river side, is being laid out as an addition to the garden. The extension, which is about 300 yards long, with an average width of 50 yards, will carry the garden up to the bridge, and thus allow of a clear view of the south wing of the Houses of Parliament from Millbank. The Victoria Tower Garden is under the control of the Office of Works. The "Burghers of Calais" was acquired for the nation by the National Arts Collections Fund. It is not a copy of the group at Calais, but is an original specimen of M. Rodin's work in bronze. The sculptor, during a recent

visit to London, was shown the selected site in the existing garden, and was greatly pleased with it.

Architectural Scholarship, British School at Rome: Second Year.

The Conditions of the second year's Scheme of Competition for the Scholarship in Architecture at the British School at Rome, offered by the Commissioners for the Exhibition of 1851, are as follows:—

The Scholarship will be of the value of £200 per annum, and will be ordinarily tenable for three years. Candidates must be British subjects, and less than thirty years of age on 1st July, 1914.

The Competition, which will be conducted by the Faculty of Architecture of the British School at Rome, will be in two stages:—

A. An Open Examination.

B. A Final Competition, open to not more than ten candidates selected from those competing in the Open Examination.

A. THE OPEN EXAMINATION.

Competitors should notify the Honorary General Secretary, British School at Rome, 54 Victoria Street, London, S.W., of their intention to compete in this Examination as early as possible, and in any case not later than the 24th January, 1914, and with such notification must enclose a certificate of birth or a declaration as to age and nationality, duly attested by two responsible persons.

The subject for this Examination will be AN ART GALLERY, situated in the public park of an important provincial town.

The building to have a frontage towards the south of 250 feet (on which frontage is to be the principal entrance), with a depth of 100 feet, and to consist, on the ground floor, of a central top-lighted Hall for Sculpture, with side-lighted galleries around it. The first floor to have top-lighted galleries. A lower floor for reserve exhibits and stores may be provided, and the design may include any terrace, steps, and architectural adjuncts thought necessary for the completion of the design.

The size given may be exclusive of any architectural projections, such as porticoes or other architectural features.

The drawings required are:—

Plans of the two principal floors,

Front and side elevations,

Longitudinal and transverse sections—all to a scale of $\frac{1}{8}$ inch to a foot.

A detail of an important portion of the front to $\frac{1}{2}$ -inch scale.

A perspective in which the building shall measure 18 inches.

A short descriptive report must accompany the design.

The general drawings may be finished in ink or pencil, and the view in any manner at the competitor's discretion.

Each design must bear a motto, and must be accompanied by an envelope enclosing the name of the competitor.

Drawings must not be executed as part of a school course, and the competitor must submit a written statement to the effect that this regulation has been complied with, together with a declaration that the work has been done by his own hand.

The drawings, together with the above-mentioned documents, must be sent to the Honorary General Secretary, British School at Rome, c/o The Secretary, Royal Institute of British Architects, 9 Conduit Street, W., and must reach him on or before 31st January, 1914.

B. THE FINAL COMPETITION.

This Competition will be held "en loge" in London, and particulars regarding it will be announced hereafter.

The successful candidate in this Competition will be recommended for appointment to the Commissioners' Scholarship.

GENERAL.

The Faculty reserve to themselves the right, at their absolute discretion, to alter any of the conditions, periods, dates or times herein specified, and to decline to hold the Final Competition, or to select any candidate for it, or to make any recommendation for the Scholarship.

The Faculty also reserve to themselves the right to publish photographic reproductions of, or to exhibit, any of the works submitted by competitors.

Copies of the conditions may be obtained from the Hon. General Secretary, Mr. Evelyn Shaw, Office of the British School at Rome, 54 Victoria Street, S.W.

School of Architectural Studies, University of Cambridge.

In connection with the School of Architectural Studies which has been established in the University of Cambridge, a new schedule for the Examination in Architectural Studies has just been passed which covers the whole range, both theoretical and historical, of architecture. The intention has been to make the course available for students coming up to the University who propose to become architects and desire to devote some of their time to professional studies. There are courses on Elementary Mechanics, Practical Mathematics, and Theory of Structure, given at the Engineering School of the University, and instruction in Architectural Drawing, Surveying, and Elementary Design, undertaken by Mr. E. S. Prior [F.], Slade Professor of Fine Art, with the assistance of Mr. J. M. Dawson [A.], in the Drawing School, where also drawings as Testimonies of Study for the R.I.B.A. Intermediate Examination can be prepared. The courses on the General History of Art, History of Architecture, both general and of special periods, and on the Theory of Art in relation to architecture, are given by the Slade Professor, the Disney Professor of Archaeology, the University Reader in Classical Archaeology, and other lecturers. Candidates who intend to sit for the R.I.B.A. Intermediate Examination are entitled to certain exemptions on producing a certificate of having passed the two parts of the Examination in Architectural Studies. The course of study is so arranged as to fit in with a large number of other courses such as are required for obtaining the B.A. degree. The possible combination, with the best arrangements of time and studies, as well as a detailed syllabus of the Examination, can be obtained from the Secretary to the Board of Architectural Studies, Gonville and Caius College, Cambridge.

University of Sheffield: Degree Course in Architecture.

At a meeting of the Court held on 27th June, certain important modifications in the arrangements for the teaching of Architecture in Sheffield

University received final approval. The Department of Architecture, which has been for the last six years in the Faculty of Applied Science, is now transferred to the Faculty of Arts, and in addition to the three years' course leading to the Certificate in Architecture, and the five years' course leading to the Diploma, the Department now provides a five years' course leading to the Degree of Bachelor of Arts with Honours in Architecture. Before commencing the course for this Degree, candidates must pass, or obtain exemption from, the Matriculation Examination of the Joint Matriculation Board of the Northern Universities.

During the first year of the Degree Course, students prepare for a special Intermediate Examination in the following subjects: (1) Latin; (2) English, French, German, or Greek; (3) Ancient, Mediaeval, or Modern History; (4) History of Architecture; (5) Mathematics (Pure or Pure and Applied). Thus, in addition to the subject History of Architecture, candidates for the Degree must satisfy the examiners in four subjects in the Intermediate Examination in Arts. This is one of the highest standards of non-technical education required in an English School of Architecture.

During the second and third years the candidates prepare for the first part of the Degree Examination, the subjects of which are (1) History of Architecture, (2) Ancient Art, (3) Applied Construction including Sanitation, (4) Theoretical Construction and Laboratory Course in Mechanics, (5) Materials of Construction, including the Chemistry and Testing of Materials, and (6) Geometry and Perspective.

The second part of the Degree Examination is held at the end of the fifth year, papers being set in (1) Applied Construction, (2) Theoretical Construction, (3) Materials of Construction, (4) Sanitation, (5) Specifications, Estimating, and Professional Practice, (6) Design, (7) Principles of Architecture.

Measured Drawings, Designs, and Drawings of Construction prepared during the course must be submitted and approved at each part of the Examination.

During the first three years candidates for the Degree work full time at the University, but during the last two years most of their day-time must be spent in the office of an architect. The course is thus intended to supplement, rather than to take the place of, office training.

Important points in this Degree Course are:—

(1) The high standard required in non-technical subjects; (2) The careful study required, not only in the History of Architecture and Design, but also in such subjects as Applied and Theoretical Construction, Materials, Sanitation, &c.; (3) Candidates must produce evidence of practical training in the office of an architect; (4) Candidates must attend a certain number of Vacation Courses, and

thus spend from eight to twenty-two weeks in the study of buildings of architectural interest.

Students who have not passed the Matriculation Examination may take the Certificate and Diploma Courses, but will be required to show that they are qualified to benefit from them. Students who are unable to take a complete course may, by arrangement, take any part or parts approved by the Lecturer.

Further particulars may be obtained from the Lecturer, Mr. W. S. Purchon [A.].

Aberdeen School of Architecture.

On the results of the past three years' work the first "Diploma" of the Aberdeen School of Architecture has recently been awarded to Mr. Morrison Hendry, on the recommendation of Mr. H. V. Lanchester [F.], the assessor appointed by the Scotch Education Department to visit the school. Day classes in architecture came into existence in Aberdeen three years ago, when Mr. Harold Hughes [A.] was appointed to the school and students were enabled to receive instruction in preparation for the "Diploma." Of late, with the co-operation of the Aberdeen Society of Architects, a scheme has been drawn up whereby students will spend their first two years at the school, followed by three years in an architect's office, continuing, during this latter period, their school work in evening classes. The syllabus for the course has been provisionally approved by the Board of Architectural Education, and work under this new arrangement began at the opening of the session on 27th August.

Timber: Course of Lectures for Architects.

Professor Percy Groom, D.Sc., F.L.S., will give during the forthcoming Session at the Royal College of Science a course of nine or ten lectures and demonstrations on Timber for Engineers and Architects. The lectures will deal with the structure, identification, and physical properties (strength, elasticity, weight, colour, durability, &c.) of timber commonly used for engineering purposes (in houses, in mines, on railways, for paving-blocks, &c.) in Europe; structural characters determining the qualities of these; defects in timbers; their identification and their effects on the various physical properties of wood; methods of improving the qualities of various timbers (including "impregnation," &c.). The lectures will be delivered on Tuesdays and Thursdays, from 2 to 3 P.M., beginning Thursday, 9th October next, and laboratory work from 3 to 4 P.M. on the same days. The fee for the course is £1.

Architectural Lectures at London University.

Mr. A. E. Richardson, Licentiate R.I.B.A., has been appointed Carpenters' Company Lecturer in the School of Architecture of London University for the forthcoming session. The subject of his course

will be "The Work of the English Architects of the Eighteenth Century, and of the Greek Revivalists of the first half of the Nineteenth Century." He will deliver ten public lectures on Thursdays, at 6 P.M., beginning 16th October.

Council Appointments to Standing Committees.

The following appointments to the four Standing Committees have been made by the Council under By-law 51:—

ART.—Walter Cave [F.]; T. Raffles Davison [H.A.]; H. P. Burke Downing [F.]; C. Wontner Smith [F.]; Percy W. Lovell [A.].

LITERATURE.—Arthur T. Bolton [F.]; J. D. Cragg, F.S.A. [H.A.]; E. A. Rickards [F.]; Herbert Wigglesworth [F.]; John S. Lee [A.].

PRACTICE.—E. J. Gosling [F.]; Albert W. Moore [F.]; H. A. Satchell [F.]; Septimus Warwick [F.]; H. A. Saul [A.].

SCIENCE.—R. Stephen Ayling [F.]; Professor W. C. Unwin, F.R.S., M.Inst.C.E. [H.A.]; A. T. Wadmisley, M.Inst.C.E. [H.A.]; H. W. Burrows, F.G.S. [A.]; E. Stanley Hall, M.A. Oxon. [A.].

Officers of Standing Committees.

The Standing Committees for the new Session have elected their officers as follows:—

ART.—E. Guy Dawber, *Chairman*; H. Heathcote Statham, *Vice-Chairman*; Percy W. Lovell and W. A. Forsyth, *Hon. Secretaries*.

LITERATURE.—W. Henry Ward, *Chairman*; C. E. Sayer, *Vice-Chairman*; C. Harrison Townsend and W. G. Newton, *Hon. Secretaries*.

PRACTICE.—Wm. Woodward, *Chairman*; Max Clarke, *Vice-Chairman*; H. A. Satchell and Matt. Garbutt, *Hon. Secretaries*.

SCIENCE.—F. R. Farrow, *Chairman*; Digby L. Solomon, *Vice-Chairman*; George Hornblower and G. Leonard Elkington, *Hon. Secretaries*.

OBITUARY.

William Clement Williams, Fellow, elected 1890, died at his residence at Port Erin, Isle of Man, on the 3rd June. Mr. Williams was articled in 1866 to Mr. Edwin Dalby, ecclesiastical architect, of Abingdon, Wantage, and Bideford. In 1869 he entered the office of Messrs. Horsfall, Wandle & Patchett, of Halifax, as chief assistant; and in 1872 joined Mr. Horsfall as partner. The firm had a large and varied practice, and were responsible for a number of school buildings, shops and business premises, mills and factories, and residential buildings in Halifax and the vicinity. Mr. Williams' design submitted in a limited competition for the Halifax Infirmary was placed second, and was highly commended by the late Mr. Alfred Waterhouse, R.A., the Assessor.

George H. Bibby, whose death took place some few weeks ago at Twickenham, in his sixty-ninth year, was until recently a Fellow of the Institute. He served his articles with the late

Mr. G. Fowler Jones [F.], of York, whose work was chiefly in connection with churches and asylums, and subsequently held various engagements in Birmingham, Bolton, &c., and also in Manchester, where he practised for many years. The claims of a large family led later to his seeking and securing a more certain source of income with the London County Council, in whose employ he continued till failing health compelled his retirement. Besides being a frequent contributor to the building journals, Mr. Bibby was the author in book form of *Asylum Construction and Arrangement* (two editions, Drake, Driver & Leaver, Limited); *Planning of Lunatic Asylums*, *Housing of Pauper Lunatics*, *Planning of Workhouses*, &c. (B. T. Batsford.) ROBERT F. HODGES [A.].

COMPETITIONS.

Tending Cottage Homes.

The Competitions Committee of the Royal Institute desire it to be known that the conditions of this Competition are not satisfactory and are the subject of correspondence between the Committee and the promoters.

LEGAL.

What is White Lead?

In the King's Bench Division, on the 8th July, before Mr. Justice Avory, a settlement was announced in the case of Thomas Raban and Son, of Baldock, Herts., v. Thomas Merry and Co. Ltd., of Suffolk Street, Birmingham. The action was brought with the object of establishing a clear definition of the term "white lead" to prevent confusion with other materials of a similar character.

Mr. C. C. Hutchinson, K.C., and Mr. G. C. Hutchinson, instructed by Messrs. White and Leonard, appeared for the Plaintiffs. Mr. T. Terrell, K.C., and Mr. Maddocks, instructed by Messrs. Jaques and Co., for the defendants.

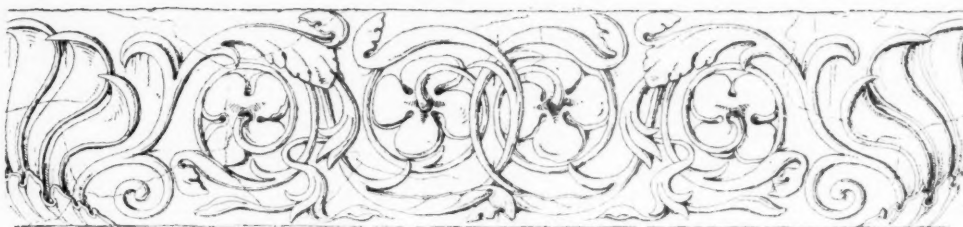
Counsel for the Plaintiffs said that the parties had come to terms, and it was desired to submit the terms of settlement, which were as follows:—

The Defendants admit that, as alleged in the statement of claim, on a sale of goods by and under the description of white lead, it is a condition to be implied according to the usage and custom of the trade that the substance to be sold and delivered should be the substance commonly known as white lead, otherwise hydrated oxy-carbonate of lead, and also admit that they supplied to the Plaintiffs a pigment which was of a different description and composition, being composed not of hydrated oxy-carbonate of lead, but of sulphate of lead. The Plaintiffs admit that the Defendants did not make any representations intentionally or fraudulently so as to induce the Plaintiffs to enter the said contract. And Plaintiffs and Defendants in consideration of the respective admissions have mutually agreed to settle the said action. The Defendants undertake that at all times hereafter they will not offer for sale, or sell and deliver in the course of their business, any substance or pigment under the name of "white lead" other than the substance or pigment commonly known as white lead—viz., hydrated oxy-carbonate of lead.

Counsel for the Defendants agreed to these terms.



19



RECENT DEVELOPMENTS AFFECTING SCHOOL BUILDING.

By PERCY MORRIS [A.], Cates Prizeman 1897, Architect to the Devon County Education Committee.

(Continued from page 672.)

The *Derbyshire Schools* are of several forms, shown by figs. 14-19 inclusive. In addition to cross ventilation a point is made of bi-lateral lighting in several of the rooms. Figs. 16 and 17 were planned to allow of three classrooms being built in the first instance, with a view to subsequent extension of the school. Figs. 18 and 19 show a further development, a feature being the cross ventilation of the cloakrooms. The aspect of the rooms is not shown, but it is claimed that each room obtains sunlight during some part of the day.

The *External Corridor Type* is shown in fig. 20 (built in 1909). Fig. 21 is an example of the same type of building, with a hall designed for use also as a playroom, an isolated and cross ventilated cloakroom, and a corridor which may be used, as I have indicated, as a reservoir of fresh air for ventilating purposes under special circumstances. The site is largely answerable for the shape of the plan. Fig. 22, a three-story building, also has an independent hall and shallow classrooms.

The *Central Corridor Type* is one of which several examples have recently appeared, but unless carefully used it is likely to lead to an undesirable development. In its best form it is reasonably satisfactory, and on a narrow or hilly site it is the most economical type for a large department. This fact makes it necessary to adopt it sometimes, although it is impossible to be enthusiastic about it. By keeping the corridor ceiling down clerestory lights are obtained above the flat roof to provide cross ventilation; these give also some amount of sunlight to rooms facing north. The principle is being largely applied in re-modelling old schools, and presents in some instances about the only possible solution of the problem upon the newer lines. I should like to see a rule made confining its use to one-story buildings—or, if used for a two-story building, that the classrooms must be placed on the upper floor only; and in both cases on condition that the ends of the corridor are kept free for windows so that this can be air-flushed for its entire length. Directly it is applied to classrooms on two floors of a building, or the corridor is intercepted by a lateral hall, it fails in my opinion in achieving its object. Closed ends must inevitably interfere with natural ventilation.

Fig. 23 shows an example of the central corridor type placed first in a recent competition,* and designed for a difficult site about 110 feet wide, where the shape of the playground required careful consideration. Fig. 24 is a plan of a school we have in hand at the present time. The site slopes 1 in 3, and was as favourable a one as was to be had in the neighbourhood. The building must be as economical as possible, and this points to a narrow and compact plan. The width of the frontage does not admit of a single line of classrooms, the basement must there-

* See note at end of paper, p. 706.